



THE CITY OF LEON VALLEY
SPECIFICATIONS AND PLANS

LEON VALLEY GATEWAY MONUMENTS

MAYOR
CHRIS RILEY

CITY MANAGER
MANUEL LONGORIA, JR.

CITY COUNCIL
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DIRECTOR OF PUBLIC WORKS
MELINDA S. MORITZ SMITH

DECEMBER 2013

BID ADVERTISEMENT

ADVERTISEMENT FOR BIDS FOR: LEON VALLEY GATEWAY MONUMENTS - PROJECT ESTIMATE IS \$465,000

The City of Leon Valley, Texas, will receive sealed bids until Tuesday, January 14, 2014, at 2:00 p.m., at the Office of the Purchasing Agent of the City of Leon Valley, TX, 6400 El Verde Road, Leon Valley, TX 78238, at which time bids will be publicly opened and read aloud.

Specifications and plans are available online on the City of Leon Valley's website at www.leonvalleytexas.gov. There are NO printed specifications nor plans. For assistance, call (210) 684-1391 ext. 222.

Bids must be submitted on the bid form furnished within the specifications and submitted in a sealed envelope and clearly endorsed "**LEON VALLEY GATEWAY MONUMENTS BID**". Each bid shall be accompanied by a bid guarantee in the form of a certified check, cashier's check, or bid bond in the amount of five percent (5%) of the total bid price. Any bid received after closing time will be returned unopened.

Attention is called to the fact that, pursuant to V.T.C.S. Art. 5159a, not less than the local prevailing wage rate derived from Leon Valley Ordinance #99-001, must be paid on this locally funded project.

The successful bidder will be required to furnish a one hundred percent (100%) Performance Bond and one hundred percent (100%) Payment Bond.

The City of Leon Valley reserves the right to reject any and all bids, to award the contract in what it deems its best interest and to waive any informality or technicality in the bid, and agrees to take action within sixty (60) days after the bid opening.

BID FORM

LEON VALLEY GATEWAY MONUMENTS

*For consideration, return this bid form no later than **2:00 p.m., Tuesday, January 14, 2014** to:*

Purchasing Agent
City of Leon Valley
6400 El Verde Road
Leon Valley, Texas 78238

Bid proposal of _____,
a corporation, organized and existing under the laws of the State of Texas, a partnership/an
individual doing business as _____
(cross out non-applicable references).

To the City of Leon Valley (hereinafter called Owner).

In response to your request for bids for **LEON VALLEY GATEWAY MONUMENTS BID** and having
examined the specifications and related documents, I hereby propose to furnish all labor,
materials and supplies to complete the work in accordance with the BID DOCUMENTS at the
price stated below. These prices are to cover all expenses incurred in performing the work
required under the contract documents, of which this Bid is part.

This bid will be awarded by City Council, and a contract will be executed between the City of
Leon Valley and the vendor.

I agree to commence work within _____ days upon execution of contract. I will
complete the entire project within _____ days.

Bidder acknowledges receipt of the following addenda (if any): _____

PART 1 - BASE BID

ITEM #1	
DESCRIPTION	TOTAL PRICE
Proposed Leon Valley Eckhert Rd. Entry Gateway Feature, Complete in Place, including Monument Sign, Landscape Improvements, Electrical Improvements, and Median Improvements as per the Plans and Specifications	\$

at _____ dollars
and _____ cents

ITEM #2	
DESCRIPTION	TOTAL PRICE
Proposed Leon Valley Grass Hill Dr. Entry Gateway Feature, Complete in Place, including Monument Sign, Landscape Improvements, Electrical Improvements, and Median Improvements as per the Plans and Specifications	\$

at _____ dollars
and _____ cents

TOTAL ITEMS 1 AND 2	\$
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at _____ dollars
and _____ cents

PART 2 – UNIT PRICES (for Additions or Deletions Only)

In consideration of submitted bids, bidders are required and shall fully complete each unit bid price line on the unit pricing form contained herein. Any unit bid price line left incomplete or determined by the City to be underpriced may result in a submitted bid being deemed non-responsive. Bidders agree that the unit bid prices submitted on said form will be held throughout the duration of this contract.

Bidder hereby certifies that the unit prices shown on this form in this bid proposal are the unit prices intended for this project.

These unit prices are 'complete and in place', and include but are not limited to: necessary superintendence, labor, machinery, equipment, tools, materials, mobilization, insurance, overhead and other miscellaneous items and cost to complete the proposed work.

It is further understood that these unit prices may be used by the City of Leon Valley to adjust the final bid or contract amount through additions to or deletions from the scope and amount of work for the project, at the sole discretion of the City of Leon Valley.

Bidder agrees to the terms, conditions, and requirements of the bidder's bid proposal.

Item	Description	Unit	Unit Cost
1	Clearing and Grubbing	SY	
2	Temporary Silt Fence	LF	
3	Existing Curb and Gutter Removal & Disposal	LF	
4	Existing Asphalt Paving Removal & Disposal	SY	
5	Existing Concrete Paving Removal & Disposal	SY	
6	Site Grading	CY	
7	Site Grading Fill Material	CY	
8	Curb and Gutter	LF	
9	Integral Color Concrete Mow Strip	SY	
10	ADA Detectable Warning Strip Pavers with Concrete Base	EA	
11	Traffic Control During Construction	LS	
12	Inlet Gravel Filter	EA	
13	Stone Pavers with Concrete Base	SF	

14	Concrete Paving	SY	
15	24" Lateral Storm Pipe	LF	
16	Catch Basin Inlet	EA	
17	Entry Monument Sign	EA	
18	Electrical Service	LS	
19	Electrical Panels	EA	
20	Electrical Breakers	EA	
21	Electrical Conduit	LF	
22	Directional Bore under Road	LF	
23	Electrical LED Sign Strips	EA	
24	Electrical Uplight Fixtures	EA	
25	Decomposed Granite – Dark Red	CY	
26	Decomposed Granite – Medium Brown	CY	
27	Rock Rip Rap – 4"-8" Limestone – Dark Brown Blend	CY	
28	Rock Rip Rap – 4" Gravel Base	CY	
29	Steel Edging	LF	
30	Filter Fabric	SF	
31	Top Soil	CY	
32	Variegated Smooth Agave – 5 gal.	EA	
33	Red Yucca – 3 gal.	EA	
34	Cherry Sage – 3 gal.	EA	
35	Purple Lantana – 1 gal.	EA	
36	Trailing Rosemary – 1 gal.	EA	
37	Black-Eyed Susan – 1 gal.	EA	
38	Bermuda Grass Hydroseed	SF	

NOTE: Submit a certificate of insurance for workers compensation or a certificate of authority to self insure with bid.

I agree to perform all the work described in the BID for the preceding prices.

Amounts are to be shown in both words and numeric figures. In case of discrepancy, the amount shown in words will govern.

The above prices shall include any and all labor, materials, non-exempt tax material, removal, disposal, overhead, profit, insurance, etc., to cover the finished work.

I understand that the OWNER reserves the unqualified right to reject any or all bids and to otherwise award in its best interest.

Non-Collusion Statement: By signing this bid proposal, the Bidder agrees that his proposal is made without any understanding, agreement or connection with any other person, firm or corporation making a proposal for the same purpose and that his proposal is in all respects fair and without collusion or fraud.

RESPECTFULLY SUBMITTED:

Signature

Company

Printed Name

Address

Title

City, State, and Zip Code

Date

Telephone Number / Fax Number

License No. (if applicable)

Web Address / Email Address (if applicable)

(Seal - if bid is by a Corporation)

Attest

GENERAL INFORMATION

1. CLARIFICATIONS OR ADDENDA

Requests for clarifications shall be submitted in writing to the Purchasing Agent, no less than five (5) days prior to the bid opening. Answers to the request will be provided in the form of an Addendum to the contract documents and will be made available in the same manner as the specifications and plans no less than two (2) days prior to the bid opening. It is, however, the bidder's responsibility to make inquiry as to any addenda issued. All such addenda shall become part of the contract documents and all bidders shall be bound by such addenda. Failure to acknowledge any and all addenda will result in a non-responsive bid and will therefore be rejected.

2. INSPECTION OF SITE

Each bidder should visit the site of the proposed work and fully acquaint himself with the existing conditions there and should fully inform himself as to the facilities involved, the difficulties and restrictions attending the performance of the contract. The bidder should thoroughly examine and familiarize himself with the drawings, technical specifications and all other contract documents. The contractor by the execution of the contract shall in no way be relieved of any obligation under it due to his failure to receive or examine any form or legal document or to visit the site or acquaint himself with the conditions there existing. The City will be justified in rejecting any claim based on facts regarding that which the bidder should have been on notice of as a result thereof.

3. BIDS

- A. All bids must be submitted on the forms provided and are subject to all requirements of the Contract Documents, including the Drawings.
- B. All bids must be regular in every respect and no interlineation, excisions or special conditions may be made or included by the bidder.
- C. Bid documents, including the Bid, the Bid Bond, Non-collusion Affidavit of Prime Bidder, and the Bidder Disclosure Statement shall be submitted with the bid in a sealed envelope and clearly labeled with the words "LEON VALLEY GATEWAY MONUMENT" along with the bid opening date and time.
- D. The City may consider as irregular any bid on which there is an alteration of or departure from the bid form and, at its option, may reject any irregular bid.
- E. If a contract is awarded, it will be awarded to the lowest responsible bidder. The contract will require the completion of the work in accordance with the contract documents.

- F. The unit price for each of the several items listed in Part 2 of the Bid Form shall include its pro rata share of overhead. The unit prices may be used to determine the amount of any change orders resulting from an increase or decrease in quantities.

4. BID BOND

A Bid Bond in the amount of 5% of the bid issued by an acceptable surety shall be submitted with each bid. A certified check or bank draft payable to the City or negotiable U.S. Government Bonds (as par value) may be submitted in lieu of the Bid Bond.

5. BIDDER DISCLOSURE STATEMENT

Each bidder shall submit on the form furnished for that purpose a Bidder Disclosure Statement. The City shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform his obligations under the contract, and the bidder shall furnish the City all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available data does not satisfy the City that the bidder is qualified to carry out properly the terms of the contract.

6. CORRECTIONS

Erasures or other corrections in the bid must be noted over the signature of the bidder.

7. TIME FOR RECEIVING BIDS

Any Bid received prior to the advertised hour of opening shall be kept securely sealed. Bids received after the closing time will be rejected and returned unopened.

8. OPENING OF BIDS

Bids will be publically opened and read aloud beginning at 2:00 p.m. on Tuesday, January 14, 2014.

9. WITHDRAWAL OF BIDS

Once received by the Purchasing Agent, bids may be withdrawn only by written request delivered to the Purchasing Agent prior to the bid opening.

10. AWARD OF CONTRACT/REJECTION OF BIDS

- A. The contract will be awarded to the responsive, responsible Bidder submitting the lowest bid. The bidder selected will be notified at the earliest possible date. The City reserves the right to reject any or all bids and to waive any irregularity in bids received where such rejection or waiver is in its best interest.

- B. The City reserves the right to consider as not responsible to do the work, any bidder who does not habitually perform with his own forces the major portions of the work involved in construction of the improvements embraced in his contract.

11. EXECUTION OF AGREEMENT/PERFORMANCE AND PAYMENT BONDS

- A. A Performance Bond shall be executed in the full amount of the Contract conditioned upon the faithful performance of the work in accordance with the plans, specifications, and the Contract Documents. Said Bond shall be solely for the protection of the City.
- B. A Payment Bond shall be executed in the full amount of the Contract, solely for the protection of all proper claimants supplying labor and material in the prosecution of the work provided for in the Contract, for the use of each such claimant perfecting a proper claim.
- C. Such bonds must be issued by a corporate surety authorized to do business in the State of Texas.
- D. The failure of the successful bidder to execute the agreement and supply the required bonds and insurance certificates within 10 days after the prescribed forms are presented to the prospective contractor for signature, or within such extended period as the City may grant, shall constitute a default and the City may at its option either award the contract to the next lowest responsive and responsible bidder, or re-advertise for bids. In either case, the City may charge against the bidder the difference between the amount of the bid, and the amount, and the amount for which a contract is subsequently executed, irrespective of whether this difference exceeds the amount of the bid bond. If a more favorable bid is received through re-advertisement, the defaulting bidder shall have no claim against the City for refund.

12. EQUAL EMPLOYMENT OPPORTUNITY

Attention is called to the requirements for ensuring that employees and applicants for employment are not discriminated against because of their race, age, religion, gender, physically challenged condition, or national origin.

13. TAXES

"Pursuant to State legislation enacting 34 Texas Admin. Code 3.291, in order for the City to continue to benefit from its status as a State Sales and Use Tax Exempt Organization, after August 14, 1991 construction contracts must be awarded on a "separated contract" basis. A "separate contract" is one that distinguishes the value of the tangible personal property (materials such as pipe, bricks, lumber, concrete, paint, etc.) to be physically incorporated into the project, from the total contract price. Under the "separated contract" format, the contractor in effect becomes a "seller" to the City of materials that are to be physically incorporated into the project reality. As a "seller", the contractor will issue a "Texas Sales

and Use Tax Resale Certificate" to the supplier in lieu of paying the sales tax on materials at the time of purchase. The contractor will also issue a "Certificate of Exemption" to the supplier demonstrating that the personal property is being purchased for resale and that the resale is to the City of Leon Valley, Texas, Bexar County, which is a sales tax exempt entity under UTCA Tax Code Section 151.309(5). Contractors should be careful to consult the most recent guidelines of the State Comptroller of Public Accounts regarding the sales tax status of supplies and equipment that are used and consumed during project work. Contractors that have questions are asked to inquire with the State Comptroller of Public Accounts, Tax Administration Division, State of Texas, Austin, Texas 78744 at (512) 463-4934. Bidders will not include any federal taxes in bid prices since the City is exempt from payment of such taxes. "Texas Certificates of Exemption", "Texas Certificates of Resale" and "Texas Sales Tax Permits" are forms available to the contractor through the regional offices of the State Comptroller of Public Accounts.

14. GENERAL STATEMENT

- A. This is a 100% locally funded and competitively bid Public Works Contract and Article 5159a, Revised Civil Statutes of Texas, as amended, requires that not less than the general prevailing wage rates (minimum hourly base pay and minimum hourly fringe benefits contribution) for work of similar character be paid to CONTRACTOR and subcontractor employees. These local prevailing and adopted wage rates are derived from the most current applicable federal prevailing wage rates as published by the United States Department of Labor, Dallas, Texas pursuant to the original intent and authority of the City of Leon Valley Ordinance 99-001 passed by the City Council of the City of Leon Valley. Copies of both the current Ordinance and the wage rates are contained in the Special Conditions, and are included instruments of this Contract and full compliance with same shall be required.
 - 1. Any deviation from Wage and Labor Standard Provisions compliance may be cause for City's withholding either interim or final payment to the CONTRACTOR until such deviations are properly corrected.

15. WAGE AND HOUR OFFICE, PUBLIC WORKS, AND RESPONSIBILITIES

- A. The City of Leon Valley Wage & Hour Monitor is primarily responsible for all Wage and Labor Standard Provisions investigation and enforcement and will monitor CONTRACTOR/subcontractors practices to assure the City Manager that:
 - 1. Appropriate weekly compliance statements and payroll records are submitted to the City by the CONTRACTOR/subcontractors and that such are reviewed for compliance with Wage and Labor Standard Provisions.
 - 2. Apprentices/trainees working on the project are properly identified by CONTRACTOR/subcontractor on payroll records and documented as being included

in programs currently sanctioned by appropriate federal or state regulatory agencies.

3. Applicable Wage Determination Decisions, including any applicable modifications, and related statements are posted at the work-site by the CONTRACTOR and that proper job classifications and commensurate minimum hourly base and fringe wage rates are paid.
4. Employees are periodically interviewed (at random) on each project as required.
5. That no person employed by CONTRACTOR or subcontractor is induced against his will, by any means, to give up any part of the compensation to which he is otherwise entitled.
6. That any and all periodic administrative directives to the Wage & Hour Monitor from the City Manager are being implemented.

16. CLAIMS & DISPUTES PERTAINING TO WAGE RATES

Claims and disputes not promptly and routinely settled by the CONTRACTOR/subcontractor and employees pertaining to wage rates, or to job classifications of labor employed upon the work covered by the Contract, shall be reported by the employee in writing, within 60 calendar days of employee's receipt of any allegedly incorrect classification, wage or benefit report, to the Wage & Hour Monitor, City of Leon Valley, for further investigation. Claims and disputes not reported by the employee to the City's Wage & Hour Monitor in writing within 60 calendar day period shall be deemed waived by the employee for the purposes of the City administering and enforcing the City's Contract rights against the CONTRACTOR on behalf of the employee. Waivers by the employee of this City intervention shall not constitute waivers by the City or employee to independently pursue contractual rights it has against the CONTRACTOR/subcontractor for breach of Contract and other sanctions available to enforce the Wage and Labor Standard Provisions.

17. BREACH OF WAGE & LABOR STANDARDS PROVISIONS

- A. The City of Leon Valley reserves the right to terminate this Contract for cause if the CONTRACTOR/subcontractors shall knowingly and continuously breach, without timely restitution or cure, any of these governing Wage and Labor Standard Provisions. A knowing and unremedied proven violation of these Wage and Labor Standard Provisions may also be grounds for debarment of the CONTRACTOR/subcontractor from future City of Leon Valley contracts for lack of responsibility, as determined by the City of Leon Valley. Recurrent violations, whether remedied or not, will be considered by the City Manager when assessing the responsibility history of potential CONTRACTOR/subcontractor prior to a competitive award of future Public Work projects. The general remedies stated in this paragraph 4. above are not exhaustive and not cumulative, for the City reserves legal and contractual rights to others specific

remedies outlined herein below and in other parts of this Contract and as are allowed by applicable City of Leon Valley Ordinances, State and Federal statutes.

18. EMPLOYMENT OF LABORERS / MECHANICS NOT LISTED IN WAGE DETERMINATION DECISION

In the event that a Contractor/subcontractor discovers that construction of a particular work element requires a certain employee classification and skill that is not listed in the wage determination decision contained in the original Contract Documents, Contractor/subcontractors will make prompt inquiry (before bidding, if possible) to the Wage and Hour Monitor identifying that class of laborers/mechanics not listed in the wage determination decision who are intended to be employed, or who are being employed, under the contract Using his best judgement and information resources available to him at the time, and any similar prior decisions, the City Manager, City of Leon Valley, shall classify said laborers/mechanics by issuing a special local wage determination decision to the Contractor or subcontractor, which shall be enforced by the Wage and Hour Monitor.

19. MINIMUM WAGE

- A. All laborers/mechanics employed to construct the work governed by this Contract shall be paid not less than weekly the full amount of wages due (minimum hourly base pay and any applicable minimum hourly fringe benefit contribution for all hours worked, including overtime) for the immediately preceding pay period, computed at wage and fringe rates not less than those contained in the wage determination decision included in this Contract. Only payroll deductions as are mandated by state or federal law and those legal deductions previously approved in writing by the employee, or as are otherwise permitted by state or federal law, may be withheld by the CONTRACTOR/subcontractor.
- B. Should the CONTRACTOR/subcontractor subscribe to fringe benefit programs for employees, such programs shall be fully approved by the City in adopting a previous United States Department of Labor decision on such fringe benefit programs or by applying DOL criteria, in rendering a local decision on the adequacy of the fringe benefit programs. The approved programs shall be in place at the time of City Contract execution and provisions thereof disclosed to the Wage and Hour Monitor, City of Leon Valley, for legal review prior to project commencement.
- C. Regular CONTRACTOR/subcontractor contributions made to, or costs incurred for, approved fringe benefit plans, funds or other benefit programs that cover periods of time greater than the one week payroll period (e.g., monthly or quarterly, etc.) Shall be prorated by the CONTRACTOR/subcontractor on weekly payroll records to reflect the equivalent value of the hourly and weekly summary of fringe benefits per employee.

20. OVERTIME COMPENSATION ON NON-FEDERALLY FUNDED PROJECTS

No CONTRACTOR/subcontractor contracting for any part of the non-federally funded Contract Work (except for work site related security guard services), which may require or involve the employment of laborers/mechanics, shall require or permit any laborer/mechanic in any seven (7) calendar day work period in which he/she is employed on such work, to work in excess of 40 hours in such work period, unless said laborer/mechanic receives compensation at a rate not less than one and one-half times the basic hourly rate of pay for all hours worked in excess of 40 hours in a seven (7) calendar day work period. Any applicable fringe benefits must be paid for straight time and overtime; however, fringe benefits are not included when computing the overtime rate.

21. PAYMENT OF CASH EQUIVALENT FRINGE BENEFITS

The CONTRACTOR/subcontractor is allowed to pay a minimum hourly cash equivalent of any applicable minimum hourly fringe benefits listed in the wage determination decision, in lieu of the contribution of benefits to a permissible fringe benefit plan, for all hours worked, including overtime, as described in paragraph 6. above. An employee is not allowed to receive less than the minimum hourly basic rate of pay specified in the wage determination decision.

22. WORK CONDUCTED ON HOLIDAYS – NON-FEDERALLY FUNDED PROJECTS

If a laborer/mechanic is employed in the normal course and scope of his or her work on the job site on New Year's Day, Martin Luther King Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, or Christmas Day, or the calendar days observed as such in any given year, work shall be paid for at a no less than one and one half times the regular minimum hourly base pay regardless of the total number of hours the laborer/mechanic has accumulated during the pay period.

23. UNDERPAYMENT OF WAGES OR SALARIES

- A. When a "full investigation" (as called for in and as construed under Article 5159a, Section 2, and as further generally described in an administrative directive to the City's Wage & Hour Monitor from the City Manager entitled "Conducting Wage and Labor Standards Investigations on 100% Locally-funded City Construction Project", as may be amended) evidences' underpayment of wages by CONTRACTOR or subcontractor to laborers/mechanics employed upon the work covered by the Contract, the City of Leon Valley, in addition to such other rights as may be afforded it under State and/or Federal law and/or this Contract, shall withhold from the CONTRACTOR, out of any payments (interim progress and/or final) due the CONTRACTOR, so much thereof as the City of Leon Valley may consider necessary to secure ultimate payment by the appropriate party to such laborers/mechanics, of full wages required by the Contract, plus a possible penalty (See B. below). The amount so withheld, excluding any possible penalty to be retained by the City, may be disbursed at an appropriate time after "full investigation"

by the City of Leon Valley, for and on behalf of the CONTRACTOR/subcontractor (as may be appropriate), to the respective laborers/mechanics to whom the same is due, or on their behalf to fringe benefit plans, funds, or programs for any type of minimum fringe benefits prescribed in the applicable wage determination decision.

- B. Article 5159a, Revised Civil Statutes of Texas, as amended, states that CONTRACTOR shall forfeit as a penalty to the City of Leon Valley the sum of sixty dollars (\$60.00) for each calendar day, or portion thereof, for each laborer, workman, or mechanic, who is paid less than the said stipulated rate for any work done under this Contract whether by the CONTRACTOR himself, or by any subcontractor working under him. Pursuant to and supplemental of this statutory authority, the City of Leon Valley and the CONTRACTOR/subcontractor contractually acknowledges and agrees that said sixty dollars (\$60.00) a statutory penalty shall be construed by and between the City of Leon Valley and the CONTRACTOR/subcontractor as liquidated damages, and not as a penalty, and will apply to any violations of paragraph 6, 7 or 9 herein, resulting from CONTRACTOR/subcontractor underpayment violations.
- C. If unpaid or underpaid workers cannot be located by the CONTRACTOR or the City after diligent efforts to accomplish same, unpaid or underpaid wages shall be reserved by the City in a special “unfound worker’s account” established by the City of Leon Valley, for such employees. If after one (1) year from the final acceptance of the project by the City, workers still cannot be located, in order that the City can make effective interim re-use of the money, such wages, and any associated liquidated damages may be used to defray actual costs incurred by the City in attempting to locate said workers, and any remaining monies may then revert back to the City’s original funding source for the project. However, unpaid or underpaid workers for whom money was originally reserved are eligible to claim recovery from the City for a period of not to exceed three (3) years from the final acceptance of the project by the City. Recovery after expiration of the three (3) year period is prohibited.

24. POSTING WAGE DETERMINATION DECISIONS AND NOTICE TO LABORERS’/ MECHANICS’ STATEMENTS

- A. The applicable wage determination decision as described in the “General Statement” (and as specifically included in each project contract), outlining the various workers’ classifications and mandatory minimum wages and minimum hourly fringe benefits deductions, if any, of laborers/mechanics employed and to be employed upon the work covered by this Contract, shall be displayed by the CONTRACTOR/subcontractor at the site of work a conspicuous and prominent public place, readily and routinely accessible to workmen for the duration of the project. In addition, the CONTRACTOR/subcontractor agrees with the contents of the following statement, and shall display same, in English and Spanish, near the display of the wage determination decision at the site of work:

NOTICE TO LABORERS/MECHANICS

Both the City of Leon Valley and the CONTRACTOR/subcontractor agree that you must be compensated with not less than the minimum hourly base pay and minimum hourly fringe benefit contribution in accordance with the wage rates publicly posted at this job site, and as are applicable to the classification of work you perform.

Additionally, you must be paid not less than one and one-half times your basic hourly rate of pay for any hours worked over 40 in any seven (7) calendar day work period, and for any work conducted on New Year's Day, Martin Luther King Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day or the calendar days observed as such in any given year.

Apprentice and trainee hourly wage rates and ratios apply only to apprentices and trainees recognized under approved Federal, or State, apprenticeship training programs registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

If you believe that your employer is not paying the posted minimum wage for the type of work you do, you must make direct inquiry to the employer and inquire in writing, within 60 days calendar days of your receipt of any allegedly incorrect wage or benefit check or report, to the City of Leon Valley Wage & Hour Monitor, 6400 El Verde Road, San Antonio, Texas 78238.

It is mandatory that you promptly file written inquiry of any allegedly incorrect wage or benefit checks or reports with the City of Leon Valley Wage & Hour Monitor within the 60 calendar day period, so that you do not waive your potential right of recovery under the provisions of the City of Leon Valley Public Works Contract that governs this project.

Both the City of Leon Valley and the CONTRACTOR/subcontractor agree that no laborer/mechanic who files a complaint or inquiry concerning alleged underpayment of wages or benefits, shall be discharged by the employer, or in other manner be discriminated against by the employer, for filing such complaint or inquiry.

25. PAYROLLS & BASIC PAYROLL RECORDS

- A. The CONTRACTOR and each subcontractor shall prepare payroll reports in accordance with the "General Guideline" instructions furnished by the Wage & Hour Monitor of the City of Leon Valley. Such payroll submittals shall contain the name and address of each such employee, his correct labor classification, rate of pay, daily and weekly number of hours worked, any deductions made, and actual basic hourly and fringe benefits paid. The CONTRACTOR shall submit payroll records each week and no later than seven (7) working days following completion of the work week being processed to the Wage & Hour Monitor, City of Leon Valley. These payroll records shall include certified copies of all payrolls of the CONTRACTOR and of his subcontractors, it being understood that the

CONTRACTOR shall be responsible for the submission and general mathematical accuracy of payroll from all of his subcontractors. Each such payroll submittal shall be on forms deemed satisfactory to the City's Wage & Hour Monitor and shall contain a "Weekly Statement of Compliance", as called for by the Contract Documents. Such payrolls will be forwarded to Public Works, Wage & Hour Monitor, City of Leon Valley, 6400 El Verde Road, San Antonio, Texas 78238.

- B. Copies of payroll submittals and basic supporting payroll records of the CONTRACTOR/subcontractors accounting for all laborers/mechanics employed under the work covered by this Contract, shall be maintained by CONTRACTOR/subcontractor during the course of the work, and preserved for a period of three (3) years after completion of the project. The CONTRACTOR/subcontractor shall maintain records which demonstrate: any CONTRACTOR commitment to provide fringe benefits to employees as may be mandated by the applicable wage determination decision; that the plan or program is adjudged financially responsible by the appropriate approving authority, (i.e. United States Department of Labor, United States Department of Treasury, etc.); and that the provisions, policies, certificates, and description of benefits of the plan or program as may be periodically amended, have been clearly communicated in a timely manner and in writing, to the laborers/mechanics affected prior to their performing work on the project.
- C. The CONTRACTOR/subcontractor shall make the above records available for inspection, copying, or transcribing by authorized representatives of the City of Leon Valley at reasonable times and locations for purposes of monitoring compliance with this Contract.

26. LABOR DISPUTES

The CONTRACTOR/subcontractor shall immediately notify the City Manager or his designated representative of any actual or impending CONTRACTOR/subcontractor labor dispute which may affect, or is affecting, the schedule of the CONTRACTOR's or any other CONTRACTOR's or subcontractor's work. In addition, the CONTRACTOR/subcontractor shall consider all appropriate measures to eliminate or minimize the effect of such labor disputes on the schedule, including but not limited to such measures as: promptly seeking injunctive relief if appropriate; seeking appropriate legator equitable actions or remedies; taking such measures as establishing a reserved gate, as appropriate; if reasonable feasible, seeking other sources of supply or service; and any other measures that may be appropriately utilized to mitigate or eliminate the job site and scheduling effects of the labor dispute.

27. COMPLAINTS, PROCEEDINGS, OR TESTIMONY BY EMPLOYEES

No laborers/mechanics to whom the wage, salary, or other labor standard provisions of this Contract are applicable shall be discharged, or in any other manner discriminated against by the CONTRACTOR/subcontractors, because such an employee has filed any formal

inquiry or complaint or instituted or caused to be instituted, any legal or equitable proceeding, or has testified, or is about to testify, in any such proceeding under or relating to the wage and labor standards applicable under this Contract.

28. EMPLOYEE INTERVIEWS TO ASSURE WAGE & LABOR STANDARD COMPLIANCE

CONTRACTOR/subcontractors shall allow expeditious job site entry of the City of Leon Valley Wage & Hour Monitor displaying and presenting proper identification credentials to the job site, the Wage & Hour Monitor shall observe all job site rules and regulations concerning safety, internal security and fire prevention. CONTRACTOR/subcontractors shall allow project employees to be separately and confidentially interviewed at random for a reasonable duration by the Wage & Hour Monitor to facilitate compliance determinations regarding adherence by the CONTRACTOR/subcontractor to these Wage and Labor Standard Provisions.

29. "ANTI-KICKBACK" PROVISION

No person employed in the construction or repair of any City of Leon Valley Public Works Project shall be induced, by any means, to give up to any CONTRACTOR/subcontractor or public official or employee, any part of the hourly and/or fringe benefit compensation to which he or she is otherwise entitled.

30. "FALSE INFORMATION"

Any person employed by the CONTRACTOR/subcontractor in the construction or repair of any City of Leon Valley Public Works Project, who is proven to have knowingly and willfully falsified, concealed or covered up by any deceptive trick, scheme, or device a material fact, or made any false, fictitious or fraudulent statement or representation, or made or used any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be permanently removed from the job site by CONTRACTOR/subcontractor. The City of Leon Valley reserves the right to terminate this Contract for cause as a result of serious and uncured violations of this provision.

31. EMPLOYMENT OF APPRENTICES/TRAINEES

- A. Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed and individually registered in a bona fide apprenticeship program registered with the United States Department of Labor, Employment and Training Administration, Bureau of Apprenticeship & Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his first 90 days or probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship & Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeyman in any craft classification

shall not be greater than the ratio under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not a trainee as defined in (b) below, or is not registered or otherwise employed as stated above, shall be paid the wage rate for the classification of work he actually performs. The CONTRACTOR/subcontractor is required to furnish to the Wage & Hour Monitor of the City of Leon Valley, a copy of the certification, along with the payroll record that the employee is first listed on. The wage rate paid apprentices shall not be less than the specified rate in the registered program for the apprentice's level of progress expressed as the appropriate percentage of the journeyman's rate contained in the applicable wage determination decision.

- B. Trainees will be permitted to work at less than the predetermined rate for the work performed when they are employed pursuant to an individually registered program which has received prior approval, evidenced by formal certification by the United States Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen shall not be greater than that permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress. Any employee listed on the payroll at a trainee wage rate, who is not registered and participating in a training plan approved by the Employment and Training Administration, shall be paid not less than the wage rate determined by the classification of the work he actually performs. The CONTRACTOR/subcontractor is required to furnish a copy of the trainee program certification, registration of employee-trainees, ratios and wage rates prescribed in the program, along with the payroll record that the employee is first listed on, to the Wage & Hour Monitor of the City of Leon Valley. In the event the Employment and Training Administration withdraws approval of a training program, the CONTRACTOR/subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved by the Employment and Training Administration.
- C. Paragraphs 18.a. and b. above shall not operate to exclude training programs approved by the OFCCP, United States Department of Labor and as adopted by the Associated General CONTRACTORS (AGC) of Texas, Highway, Heavy, Utilities and Industrial Branch. Guidelines for these training programs shall be the same as those established for federally funded projects. This sub-paragraph 18.c. shall not apply to those portions of a project deemed to be building construction.

D. RATIOS, APPRENTICE TO JOURNEYMAN

The ratio of Apprentice to Journeyman for this project shall be the same as the Ratio permitted under the plan approved by the Employment and Training Administration, Bureau of Apprenticeship and Training, United States Department of Labor, by craft. A copy of the allowable Ratios is included with the applicable Wage Determination Decision in the specifications for this project.

- E. When a “full investigation” (as called for in, and construed under Article 5159a, Section 2, and as further generally described in an administrative directive to the City’s Wage & Hour Monitor from the City Manager entitled “Conducting Wage and Labor Standard Investigations on 100% Locally Funded City Construction Projects”, as may be amended) evidences a violation of the Apprentice or Trainee to Journeyman ratios effective for CONTRACTOR/subcontractor employees working on this Contract, the City of Leon Valley, in addition to such other right as may be afforded it under State and/or Federal law and/or other sections of this Contract (especially paragraph 10 “Underpayment of Wages”), shall withhold from the CONTRACTOR, out of any payments (interim progress and/or final) due the CONTRACTOR, the liquidated damages (not a penalty) sum of seventy-five dollars (\$75.00) for each calendar day or portion thereof, for each certified Apprentice or Trainee employee assigned to a Journeyman that exceeds the maximum allowable Apprentice/Trainee to Journeyman ratio stipulated for any work done under this Contract, whether by the CONTRACTOR himself, or by any subcontractor working under him.

32. JOB SITE CONDITIONS

CONTRACTORS/subcontractors will not allow any person employed for the project to work in surroundings or under construction conditions which are unsanitary, unhealthy, hazardous, or dangerous as governed by industry standards and appropriate local, state and federal statutes, ordinances, and regulatory guidelines.

33. EMPLOYMENT OF CERTAIN PERSONS PROHIBITED

- A. The CONTRACTOR/subcontractor shall knowingly only employ persons of appropriate ages commensurate with the degree of required skill, strength, maturity and judgement associated with the activity to be engaged in, but not in less than the age of 14 years, as governed by Chapter 51 “Employment of Children”, Texas Labor code, (Vernon’s Texas Code Annotated) (as may be amended), and Texas Department of Labor and Standards rulings and interpretations associated with that statute. It is hereby noted that in some circumstances generally governed by this section, a federal statute (see: Fair Labor Standards Act, 29 USCS Section 212; Volume 6A of the Bureau of National Affairs Wages Hour Manual at Paragraph 96:1; “Child Labor Requirements in Non-agricultural Occupations” WH Publication 1330, July 1978 as may be amended), could pre-empt the Texas Statute and therefore be the controlling law on this subject. The CONTRACTOR/subcontractor should seek classification from state and federal agencies and legal counsel when hiring adolescent employees for particular job classifications.
- B. Prohibited persons not to be employed are also those persons who, at the time of employment for this Contract, are serving sentence in a penal or correctional institution, except that prior approval by the City Manager is required to employ any person participating in a supervised work release or furlough program that is sanctioned by appropriate state and federal correctional agencies.

- C. The CONTRACTOR/subcontractors shall be responsible for compliance with the provisions of the "Immigration Reform and Control Act of 1986" Public Law 99-603, and any related State enabling or implementing statutes, especially as they in combination apply to the unlawful employment of aliens and unfair immigration-related employment practices affecting this Contract.

34. PROVISIONS TO BE INCLUDED IN SUBCONTRACTS

The CONTRACTOR shall cause these Wage and Labor Standard Provisions, or reasonably similar contextual adaptations hereof, and any other appropriate state and federal labor provisions, to be inserted in all subcontracts relative to the work to bind subcontractors to the same Wage and Labor Standards as contained in these terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors or sub-tier subcontractors, and to give the CONTRACTOR similar, if not greater, general contractual authority over the subcontractor, or sub-tier subcontractors, as the City of Leon Valley may exercise over the CONTRACTOR.

35. GENERAL INDEPENDENT CONTRACTOR CLAUSE

This agreement does not create an employer relationship between parties. It is parties' intention that the CONTRACTOR will be an independent CONTRACTOR and not the City of Leon Valley employee for all purposes, including, but not limited to, the application of the Fair Labor Standards Act minimum wage and overtime payments, Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, Texas workers compensation law and Texas unemployment insurance law. The CONTRACTOR will retain sole and absolute discretion in the judgement of the manner and means of carrying out the CONTRACTOR's activities and responsibilities hereunder. The CONTRACTOR agrees that it is a separate and independent enterprise from the City of Leon Valley, that it has a full opportunity to find other business, that it has made its own investment in its business, and that it will utilize a high level of skill necessary to perform the work. This agreement shall not be construed as creating any joint employment relationship between the CONTRACTOR and the City of Leon Valley and the City of Leon Valley will not be liable for any obligation incurred by the CONTRACTOR, including, but not limited to unpaid minimum wages, and/or overtime premiums.

36. HOT GOODS CLAUSE

The CONTRACTOR hereby certifies that the execution of the work he will perform, that he will comply with all applicable provisions of Sections 6, 7 and 12 of the Fair Labor Standards Act of 1938, as amended, and that there will be no violations of the "hot goods" or "hot cargo" provisions of the Act involving restrictions on the use of the underage employees.

37. PROTECTION OF LIVES AND HEALTH

The CONTRACTOR shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (Public Law 91-596 and all subsequent amendments) and under Section 107 of the Contract Work Hours and Safety Standards Act (Public Law 91-54 and all subsequent amendments).

The CONTRACTOR shall have a competent person or persons, as required under the Occupational Safety and Health Act, on the site to inspect the work and to supervise the conformance of the CONTRACTOR's operations with the regulations of the Act.

This project is subject to all of the Safety and Health Regulations CFR 29, Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974, and CFR 29, Part 1910 and all subsequent amendments of General Industry Safety and Health Regulations identified as applicable to construction. CONTRACTORS are urged to become familiar with the requirements of these regulations.

38. ANTI-DISCRIMINATION IN EMPLOYMENT

- A. The CONTRACTOR and/or any subcontractor(s), if permitted, certifies complete compliance with the Federal Civil Rights Law and the Americans with Disabilities Act, agreeing to nondiscrimination based on race, age, color, religion, disability, gender, ancestry, national origin, or place of birth in employment practices, programs and services shall include but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or other compensation; and selection for training, including apprenticeship.
- B. The CONTRACTOR shall in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive consideration for employment without regard to race, age, color, religion, disability, gender, ancestry, national origin, or place of birth.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal, and _____
_____ as Surety, are hereby
held and firmly bound unto OWNER in the penal sum of _____
_____ for the payment of which, well and truly to be made, we
hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 20_____.

The Condition of the above obligation is such that whereas the Principal has submitted to the City of Leon Valley a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the LEON VALLEY GATEWAY MONUMENTS.

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish BONDS for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects, including the provision of proper insurance certificates, perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by an extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals,
and such of them as are corporations have caused their corporate seals to be hereto affixed
and these presents to be signed by their proper officers, the day and year first set forth above.

Principal

Surety

By: _____

IMPORTANT - Surety companies executing BONDS must be legally authorized by the State
Board of Insurance to transact business in the State of Texas.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a

(Corporation, Partnership or Individual)

hereinafter called Principal, and

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto:

CITY OF LEON VALLEY, 6400 EL VERDE ROAD., LEON VALLEY, TX 78238 hereinafter called OWNER, in the penal sum of _____ Dollars (\$_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, 20 _____ a copy of which is hereto attached and made a part hereof for the:

LEON VALLEY GATEWAY MONUMENTS

NOW, THEREFORE, if the Principal shall well, truly and faithfully, perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original terms thereof, and any extension thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year post-construction guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the WORK to be performed thereunder, or the SPECIFICATIONS accompanying the same, shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such

change, extension of time, alteration or addition to the terms of the contract, or to the WORK, or to the SPECIFICATIONS.

PROVIDED FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge any remaining legal right of any beneficiary hereunder, whose timely filed claim may be unsatisfied.

PROVIDED, FURTHER, that this Payment Bond is executed pursuant to the provisions of Section 2253.02 of the Texas Government Code (Vernon's Texas Codes Annotated) as amended, and all liabilities on this Bond shall be determined in accordance with the provisions of said Code and Article 7.19-1 Vernon's Texas Insurance Code to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, this instrument is executed in 4 counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20_____.

ATTEST:

_____	_____
(Principal) Secretary	Principal
(SEAL)	By: _____[S]

	(Address)

Witness as to Principal	

(Address)	

ATTEST:

_____	_____
	Surety
_____	By: _____[S]
	Attorney in Fact
(Address)	_____
_____	(Address)

Note: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must be legally authorized by the State Board of Insurance to transact business in the State of Texas.

TERMS & CONDITIONS

THE CONTRACTOR SHALL MAINTAIN THE FOLLOWING INSURANCE:

1. Workers' Compensation Insurance Coverage.

The insurance carrier shall be an admitted carrier in the State of Texas.

A. Definitions:

Certificate of coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

Person's providing services on the project ("subcontractor" in section 406.096) - includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project.

"Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

- B. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all employees of the contractor providing services on the project, for the duration of the project.
- C. The contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.
- D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental

entity showing that coverage has been extended.

- E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:
 - (1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage for all persons providing services on the project; and
 - (2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.
- F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.
- G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.
- H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.
- I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:
 - (1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all of its employees providing services on the project, for the duration of the project;
 - (2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided services on the project for the duration of the project;
 - (3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
 - (4) obtain from each other person with whom it contracts, and provide to

the contractor:

- (a) a certificate of coverage, prior to the other person beginning work on the project; and
 - (b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current coverage ends during the duration of the project;
 - (5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;
 - (6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and
 - (7) contractually require each person with whom it contracts, to performs as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.
- J. By signing this contract or providing or causing to be a provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting or classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or civil actions.
- K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of the notice of breach from the governmental entity.

2. Comprehensive General Liability Insurance

This insurance shall:

- A. Be in an amount not less than \$2,000,000 per occurrence, with a deductible of not more than \$2,500;
- B. Include coverage for the liability assumed by the Contractor under Item F. (Indemnity);

- C. Include completed operation coverage which is to be kept in force by the Contractor for a period of not less than one year after the completion of the work provided for or performed under these specifications;
- D. Not be subject to any of the special property damage liability exclusions commonly referred to as the XCU exclusions pertaining to blasting or explosion, collapse, or structural damage and underground property;
- E. Not be subject to any exclusion of property used by the insured or property in the case, custody or control of the insured or property as to which the insured for any purpose is exercising physical control;
- F. In naming the City of Leon Valley as an additional insured on your comprehensive General Liability Insurance, the following words apply:

“Contractor shall defend, indemnify and hold harmless the City of Leon Valley, its agents and employees from and against any liability, loss, cost and expense (“Liability”) claimed by a third party (including reasonable attorney’s fees and cost of defense) resulting from Contractor’s performance of the Work to the extent that such Liability:

- (1) is attributable to bodily injury, sickness, disease or death, or to the injury to or destruction of tangible personal property; and,
- (2) is caused or contributed to by any neglect or fault of Contractor, its subcontractors, or their respective employees.

Where liability is attributable to the joint negligence or fault of Contractor and any other person (including Owner), Contractor’s duty of indemnification shall be limited to Contractor’s allocable share of such joint negligence or fault.”

- G. The Insurance company must have as a minimum a current A.M. Best rating of A.

3. Comprehensive Automobile Liability in the following amounts:

Bodily Injury	\$1,000,000 per person
	\$3,000,000 per accident

Property Damage	\$300,000 per accident
-----------------	------------------------

4. General Requirements for Insurance Coverage

- A. The Certificate of Insurance furnished by the Contractor shall show by specific reference that each of the foregoing items have been provided for;
- B. Certificates of Insurance required for each copy of the agreement which

specifically set forth evidence of all required coverage will be filed with the City prior to the City's execution of the contract. Worker's Compensation Insurance coverage must be provided to the City prior to the City's award of the contract.

- C. The Certificates of Insurance furnished by the contractor as evidence of the Insurance maintained by the contractor will include a clause obligating the Insurer to give the City of Leon Valley ten (10) days prior written notice of cancellation or any material change in the insurance coverage.
- D. Waiver of Subrogation: The City of Leon Valley and the Contractor waive all rights and the rights of their respective insurance companies against each other for damages caused by fire or other perils to the extent such damages are covered by property insurance purchased by either party.

5. Anti-Discrimination in Employment

- A. The contractor (successful bidder) and/or any subcontractor(s), if permitted, certifies complete compliance with the Federal Civil Rights Law and the Americans with Disabilities Act, agreeing to non-discrimination based on race, age, color, religion, disability, gender, ancestry, national origin, or place of birth in employment practices, programs and services shall include but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or other compensation; and selection for training, including apprenticeship.
- B. The contractor shall in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, age, color, religion, disability, gender, ancestry, national origin, or place of birth.
- C. Upon request by the City of Leon Valley, the contractor shall furnish all information or reports required to investigate his/her payrolls and personnel records which pertain to current contract(s) with the City for purposes of ascertaining compliance with this non-discrimination certification.

6. General Independent Contractor Clause

This agreement does not create an employer relationship between the parties. It is the parties' intention that the contractor will be an independent contractor and not the City of Leon Valley employee for all purposes, including, but not limited to, the application of the Fair Labor Standards Act minimum wage and overtime payments, Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, Texas workers' compensation law and Texas unemployment insurance law. The contractor will retain sole and absolute discretion in the judgment of the manner and means of carrying out the contractor's activities and responsibilities hereunder. The contractor agrees that it is a separate and independent enterprise from the City of Leon Valley, that it has a full opportunity to

find other business, that it has made its own investment in its business, and that it will utilize a high level of skill necessary to perform the work. This agreement shall not be construed as creating any joint employment relationship between the contractor and the City of Leon Valley and the City of Leon Valley will not be liable for any obligation incurred by the contractor, including but not limited to unpaid minimum wages and/or overtime premiums.

7. Hot Goods Clause

The bidder hereby agrees that in the execution of the work he or she will comply with all applicable provisions of Sections 6, 7, and 12 of the Fair Labor Standards Act of 1938, as amended, and that there will be no violations of the "hot goods" or "hot cargo" provisions of the Act involving restrictions on the use of underage employees.

8. Fire Safety

The contractor shall comply with all City regulations including those regarding Fire Safety. In this regard he shall comply with all instructions of the City Fire Marshall during the course of the work.

9. Hazard Communications Act

In compliance with Article 5182b, Texas Revised Civil Statutes, all employers are required to train and educate employees on the safe use and handling of hazardous materials that employees may be exposed to in the work place. The City of Leon Valley's Fire Chief is designated as the City's HazComm Officer. Contractors of the City are also required to comply with the requirements of this Act.

Contractors are entitled to a copy of the City's workplace chemical list to which the contractor, its employees and agents may be exposed to in the workplace. Contractors are also entitled to a copy of all MSDS sheets for any hazardous chemicals which the City may have in the work place. Contractors have the obligation to inform its employees and agents of all of these requirements. Contractor shall furnish the City with the MSDS sheets for any hazardous chemical brought into the City workplace that City employees will have exposure to. Contractors shall sign the Attachment 5, "Hazard Communications Contractor Acknowledgment" certifying receipt of this information.

10. FIRE SAFETY

The contractor shall comply with all City regulations including those regarding Fire Safety. In this regard, he shall comply with all instructions of the City Fire Marshall during the course of the work.

HAZARD COMMUNICATIONS
CONTRACTOR ACKNOWLEDGMENT

IT IS HEREBY UNDERSTOOD AND AGREED THAT _____, a
Contractor under Contract to dated the _____ day of _____, 20_____,
with the City of Leon Valley has received from the City notice of the Contractor's rights under
the Texas Hazards Communications Act, the chemical list and material safety data sheets for
hazardous chemicals that will be present in the City work area.

_____, Contractor with the City of Leon Valley, understands
our obligation to inform our employees and agents of the information provided. Material
safety data sheets have been received for the following chemicals.

CONTRACTOR NAME: _____

NAME OF AUTHORIZED AGENT: _____

TITLE OF AUTHORIZED AGENT: _____

SIGNATURE OF AUTHORIZED AGENT: _____

DATE: _____

CONFLICT OF INTEREST QUESTIONNAIRE

FORM **CIQ**

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

1. Name of person doing business with local governmental entity.

2. Check this box if you are filing an update to a previously filed questionnaire.

☐ (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3. Name of local government officer with whom filer has employment or business relationship.

Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐

Yes

☐

No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐

Yes

☐

No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐

Yes

☐

No

D. Describe each employment or business relationship with the local government officer named in this section.

4.

Signature of person doing business with governmental entity

Date

PRE-BID DISCLOSURE STATEMENT

All questions must be answered or your bid will be deemed non-responsive and subject to rejection. The data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The bidder may submit any additional information he desires.

1. This Pre-Bid Disclosure Statement is submitted to the City of Leon Valley, Texas
by: _____

____ a Corporation ____ a Partnership ____ a Texas Joint Venture ____ an Individual

Address: _____ Contractor's No.: _____
City: _____ State: _____ Zip Code: _____

2. Years in business under present business name: _____

3. Years of experience in construction work of the type called for in this contract as:

____ a General Contractor ____ a Subcontractor

4. What projects has your organization completed? List most recent FIRST.

Contract Amount	Type of Work	Date Completed	Owner's Name and Address

5. What projects does your organization have under way as of this date?

Contract Amount	Type of Work	% Completed	Owner's Name and Address

6. Have you ever failed to complete any work awarded to you? ___ Yes ___ No. If "Yes", state where and why. _____

7. Are you at present in any lawsuits involving construction work of any type? ___ Yes ___ No. If "Yes", explain: _____

8. If this contract is awarded to you, your company's office administrative manager for the work will be Mr. (Ms.) _____, and your resident construction superintendent will be Mr. (Ms.) _____.

9. What experience in this type of work does the individual designated as resident superintendent above have? _____

10. What portion of the work do you intend to subcontract? _____

11. What equipment do you own that is available for the proposed work?

Quantity	Description, Size, Capacity, etc.	Condition	Years in Service	Present Location

12. Have you received firm offers from suppliers or manufacturers for all major items of material and/or equipment within the price totals used in preparing your proposal? ___ Yes ___ No

Credit Available: \$ _____ Bank reference: _____

Bonding capacity available: \$ _____

The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the Engineer and Owner in verification of the recitals comprising this Pre-Bid Disclosure Statement.

The signatory of this questionnaire guarantees the truth and accuracy of all statements herein made and all answers herein expressed.

Date this _____ day of _____, 20_____.

By: _____

Title: _____

STATE OF _____

COUNTY OF _____

Subscribed and sworn to before me this _____ day of _____, 20_____.

Notary Public

My commission expires: _____

CONTRACT

THIS AGREEMENT MADE THIS _____ day of _____, 2014, by and between _____
(a corporation organized and existing under the laws of the State of Texas) or, (a partnership consisting of _____)
or, (an individual doing business as _____)
hereinafter called the "Contractor" and City of Leon Valley hereinafter called the "City".

WITNESSETH, that the Contractor and the City for the consideration stated herein mutually agree as follows:

ARTICLE 1. Statement of Work. The Contractor shall furnish all supervision, technical personnel, labor, materials, machinery, tools, equipment and services, including utility and transportation services, and perform and complete all work required for the construction of the improvements embraced in the Project; namely, the item or items listed in the bid proposal, and required supplemental work for the Leon Valley Gateway Monuments; all in strict accordance with the Contract Documents including all addenda thereto, numbered/dated _____,
all as prepared by the City of Leon Valley.

ARTICLE 2. The Contract Price. The City will pay the Contractor for the performance of the Contract in current funds, as stipulated in the Bid for the items of work completed subject to additions and deductions.

Contractor hereby acknowledges and understands that this is a "separated contract" pursuant to recently enacted legislation contained in Texas Administrative Code, Title 34, I, 3, O§3.291. The following amount of money represents that part of the total contract price representative of the value of tangible personal property to be physically incorporated into the project realty: \$ _____.

ARTICLE 3. Contract. The executed contract documents shall consist of the following:

- a. Contract (this agreement)
- b. Addenda (if any)
- c. Bid Advertisement

- d. Signed copy of Bid Form
- e. General Information
- f. Terms and Conditions
- g. Texas Hazards Communications Contractor Acknowledgment
- h. Conflict of Interest Questionnaire
- i. Insurance Documents
- j. Technical Specifications
- k. Plans/Drawings

This Agreement, together with other documents enumerated in the ARTICLE 3, which said other documents are as fully a part of the Contract as if hereto attached or herein repeated, forms the Contract between the parties hereto. In the event that any provision in any component part of this contract conflicts with any provisions of any other component part, the provisions of the component parts first enumerated in this ARTICLE 3 shall govern, except as otherwise specifically stated.

CONTRACTOR and OWNER recognize that time is of the essence in the completion of this public project. Both parties agree that significant financial loss will be incurred should the project not be completed on time and the calculation of said damages will be difficult to determine. Both parties acknowledge the difficulty of damage calculating and expense of litigating or otherwise probing the actual costs of such delay and agree that such is not in either parties' best interest. In lieu of such determination, both parties agree to the sum \$500.00 per calendar day as liquidated damages for each calendar day the project is not substantially complete, as the sole and exclusive remedy for the damage costs of project delay. The parties agree that any dispute over damages from either party shall be limited by the daily liquidated damages amount. This amount shall be withheld from the appropriate pay request and retained by the owner as reimbursement; or in the case of damage costs due to the contractor, be billed to the owner on the final pay request once all the punch-list items are corrected upon final project completion.

IN WITNESS WHEREOF the parties hereto have caused this AGREEMENT to be executed in three (3) original copies on the day and year first above written.

(Seal)

Attest:

City of Leon Valley
Owner

Signature

By: _____

Witness

Name: _____ Manuel Longoria, Jr.

Title: _____ City Manager

(Seal)

Attest:

Contractor (State Corporation,
Individual or Partnership)

Signature

By: _____

Witness

Name: _____

Title: _____

PREVAILING WAGE RATE DETERMINATION

The following statute requires state agencies, cities, counties, independent school districts, and all other political subdivisions that engage in construction projects using public funds to include prevailing wage rates in the project bid documents and the construction contract.

Article 5159a, Texas Civil Statutes, as amended by H.B. 560, Ch. 606, Acts, 73rd Legislature, Regular Session (1993)

Pursuant to the requirements of this statute, the General Services Commission, Facilities Construction, has ascertained the following rates of wages are paid to various classifications of workers in the locality of this project.

Building construction wage rates shall be paid to all workers except those workers engaged in site work and construction beyond five feet of buildings.

Not less than the following hourly rates shall be paid for the various classifications of work required by this project. Workers in classifications where rates are not identified shall be paid not less than the general prevailing rate of "laborer" for the various classifications of work listed therein.

The hourly rate for legal holiday and overtime work shall not be less than one and one-half (1 & ½) times the base hourly rate.

The rates specified are journeyman rates. Apprentices may be used on the project and may be compensated at a rate determined mutually by the worker and employer, commensurate with the experience and skill of the worker but not at a rate not less than 60% of the journeyman's wage as shown. At no time shall a journeyman supervise more than one (1) apprentice. All apprentices shall be under the direct supervision of a journeyman working as a crew.

Welders shall receive the rate prescribed for the craft performing the operation to which the welding is incidental.

AN ORDINANCE

**ADOPTING A PREVAILING WAGE RATE FOR PUBLIC WORKS
CONSTRUCTION IN THE CITY OF LEON VALLEY IN ACCORDANCE WITH
CHAPTER 2258 OF THE TEXAS GOVERNMENT CODE AND ESTABLISHING
PENALTIES FOR VIOLATION THEREOF**

WHEREAS, Chapter 2258 of the Texas Government Code requires that a municipality awarding a contract for a public work within the geographical limits of the municipality determine the general prevailing rate of per diem wages to be paid to workers on the public work, and;

WHEREAS, the City of Leon Valley has public works contracts which require the adoption of a prevailing wage rate.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LEON VALLEY, THAT :

1. The City of Leon Valley hereby adopts as the prevailing wage rate of per diem wages to be paid workers on its public works projects the following prevailing wage rates, terms and conditions:

Section 1

Definitions:

- A. Public Work - A contract for a Public Work located within the geographical limits of the City of Leon Valley awarded by the City for construction of an improvement including a building, highway, road, excavation, and repair work or other project development or improvement, paid for in whole or in part from public funds, without regard to whether the work is done under public supervision or direction.
- B. Worker - includes a laborer or mechanic.
- C. Per Diem - The daily hourly rate wages and benefits paid to a worker.
- D. Legal Holiday - The holidays established by the City of Leon Valley.
- E. Maintenance - Work not involving substantial replacement or reconstruction. Maintenance is intended to extend the life of or protect an asset. The City of Leon Valley solely shall determine if the work performed is maintenance.
- F. Overtime - As defined in the Copeland Act.

Section 2

Applicability to Public Works.

- A. This ordinance applies only to the construction of a public work, including a building, highway, road, excavation, and repair work or other project development or improvement, paid for in whole or part from public funds, without regard to whether the work is done under public supervision or direction.

- B. This ordinance does not apply to work done directly by a public utility company under an order of a public authority or to maintenance.

Section 3

Right to be paid Prevailing Wage Rates

- A. A worker employed on a public work by or on behalf of the City of Leon Valley shall be paid:
 - (1) not less than the general prevailing rate of per diem wages for work of a similar character in the City of Leon Valley in which the work is performed; and
 - (2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.
- B. Subsection A does not apply to maintenance work.
- C. A worker is employed on a public work for the purpose of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for a public work with the City of Leon Valley.

Section 4

Determination of Prevailing Wage Rates.

- A. The City of Leon Valley shall determine the general prevailing rate of per diem wages in the locality in which the public work to be performed for each craft or type of worker needed to execute the contract and the prevailing rate for legal holiday and overtime work in accordance with the following:
 - (1) For 100% locally funded City Public Works Construction projects see Attachment A for building construction trades or Attachment B for heavy highway construction.
 - (2) For Public Works projects funded in whole or part with Federal or State funds see Attachment B.
- B. The City of Leon Valley shall specify in the call for bids for the contract and in the contract itself that wage rates determined under this ordinance shall be paid and are contained in the contract documents.
- C. The City of Leon Valley's determination of the general prevailing rate of per diem wages is final.

Section 5

Prevailing Wage Rates to be Paid By Contractor and Subcontractor, Penalty.

- A. The contractor who is awarded a contract by the City of Leon Valley or a subcontractor of the contractor shall pay not less than the rates determined under Section 4 to a worker employed by it in the execution of the contract.

- B. This ordinance does not apply to work done directly by a public utility company under an order of a public authority or to maintenance.

Section 3

Right to be paid Prevailing Wage Rates

- A. A worker employed on a public work by or on behalf of the City of Leon Valley shall be paid:
 - (1) not less than the general prevailing rate of per diem wages for work of a similar character in the City of Leon Valley in which the work is performed; and
 - (2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.
- B. Subsection A does not apply to maintenance work.
- C. A worker is employed on a public work for the purpose of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for a public work with the City of Leon Valley.

Section 4

Determination of Prevailing Wage Rates.

- A. The City of Leon Valley shall determine the general prevailing rate of per diem wages in the locality in which the public work to be performed for each craft or type of worker needed to execute the contract and the prevailing rate for legal holiday and overtime work in accordance with the following:
 - (1) For 100% locally funded City Public Works Construction projects see Attachment A for building construction trades or Attachment B for heavy highway construction.
 - (2) For Public Works projects funded in whole or part with Federal or State funds see Attachment B.
- B. The City of Leon Valley shall specify in the call for bids for the contract and in the contract itself that wage rates determined under this ordinance shall be paid and are contained in the contract documents.
- C. The City of Leon Valley's determination of the general prevailing rate of per diem wages is final.

Section 5

Prevailing Wage Rates to be Paid By Contractor and Subcontractor, Penalty.

- A. The contractor who is awarded a contract by the City of Leon Valley or a subcontractor of the contractor shall pay not less than the rates determined under Section 4 to a worker employed by it in the execution of the contract.

- B. A contractor or subcontractor who violates this section shall pay penalties in accordance with state law.

Section 6

Records.

- A. A contractor and subcontractor shall keep a record showing:
- (1) the name and occupation of each worker employed by the contractor or subcontractor in the construction of the public work; and
 - (2) the actual per diem wages paid to each worker.
- B. The record shall be open at all reasonable hours to inspection by the officers and agents of the City of Leon Valley.

Section 7

Payment greater than Prevailing Rate Not Prohibited.

This ordinance does not prohibit the payment to a worker employed on a public work an amount greater than the general prevailing rate of per diem wage.

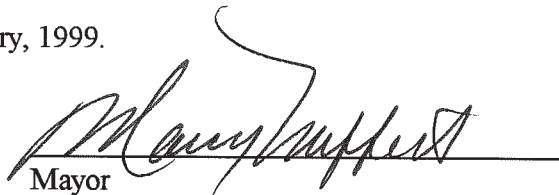
Section 8

Reliance on Certificate of Subcontractor.

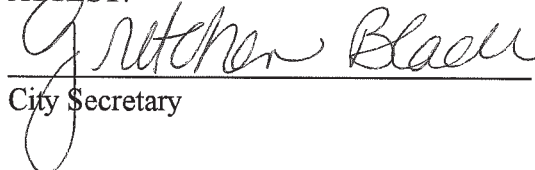
A contractor is entitled to rely on a certificate by a subcontractor regarding the payment of all sums due those working for the subcontractor until the contrary has been determined.

2. Nothing in this ordinance is intended to conflict with any state or federal laws and contractor remains bound by same.
3. This ordinance shall take effect upon passage, approval, and publication as required by law.

PASSED and APPROVED this the 5th day of January, 1999.


Mayor

ATTEST:


City Secretary

APPROVED AS TO FORM:


City Attorney

**PREVAILING WAGE RATE DETERMINATION
BUILDING CONSTRUCTION TRADES**

COUNTY NAME : BEXAR

Date Printed : April 15, 1997

CLASSIFICATION	Rate	Health	Pension	Vacation	Total Wage
ASBESTOS WORKER	\$10.36	\$0.89	\$0.00	\$0.00	\$11.25
CARPENTER	\$13.28	\$1.17	\$0.70	\$0.38	\$15.54
CARPET LAYER/FLOORING INSTALLER	\$8.00	\$0.00	\$0.00	\$0.00	\$8.00
CONCRETE FINISHER	\$9.46	\$0.05	\$0.01	\$0.01	\$9.53
DATA COMMUNICATION/TELECOM INSTALLER	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
DRYWALL INSTALLER/CEILING INSTALLER	\$11.16	\$1.18	\$0.03	\$0.02	\$12.39
ELECTRICIAN	\$15.95	\$2.15	\$1.00	\$0.08	\$19.18
ELEVATOR MECHANIC	\$17.20	\$3.85	\$2.19	\$1.50	\$24.74
FIRE PROOFING INSTALLER	\$8.00	\$0.00	\$0.00	\$0.00	\$8.00
GLAZIER	\$9.77	\$0.58	\$0.15	\$0.38	\$10.88
HEAVY EQUIPMENT OPERATOR	\$9.06	\$0.05	\$0.00	\$0.00	\$9.12
INSULATOR	\$16.28	\$2.64	\$2.15	\$0.00	\$21.07
IRON WORKER	\$10.90	\$0.66	\$0.60	\$0.33	\$12.50
LABORER/HELPER	\$7.58	\$0.42	\$0.03	\$0.07	\$8.10
LATHER/PLASTERER	\$15.50	\$0.00	\$0.00	\$0.00	\$15.50
LIGHT EQUIPMENT OPERATOR	\$6.96	\$0.05	\$0.00	\$0.00	\$7.02
MASON	\$15.55	\$0.00	\$0.00	\$0.00	\$15.55
METAL BUILDING ASSEMBLER	\$10.42	\$0.00	\$0.00	\$0.00	\$10.42
MILLWRIGHT	\$16.01	\$1.63	\$1.00	\$0.00	\$18.64
PAINTER/WALL COVERING INSTALLER	\$10.00	\$0.00	\$0.00	\$0.00	\$10.00
PIPEFITTER	\$17.07	\$1.48	\$1.47	\$0.37	\$20.39
PLUMBER	\$19.31	\$2.17	\$1.90	\$0.76	\$24.14
ROOFER	\$9.05	\$0.00	\$0.00	\$0.00	\$9.05
SHEET METAL WORKER	\$18.54	\$1.62	\$1.56	\$0.24	\$21.96
SPRINKLER FITTER	\$19.75	\$3.40	\$2.20	\$0.00	\$25.35
TERRAZZO WORKER	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TILE SETTER	\$14.77	\$1.77	\$0.00	\$0.00	\$16.54
WATERPROOFER/CAULKER	\$10.92	\$0.00	\$0.00	\$0.00	\$10.92

* \$0.00 in the rate field indicates insufficient data was received to determine a prevailing wage rate for this classification. Government Code Title 10, Section 2258.023, paragraph C states: "A contractor or subcontractor does not violate this section if a public body awarding a contract does not determine the prevailing wage rates and specify the rates in the contract as provided in Section 2258.022."

Worker Classification Definition Sheet

Asbestos Worker	Worker who removes and disposes of asbestos materials.
Carpenter	Worker who builds wood structures, or structures of any material which has replaced wood. Includes rough and finish carpentry, hardware and trim.
Carpet Layer/Flooring Installer	Worker who installs carpet and/or floor coverings - vinyl tile.
Concrete Finisher	Worker who floats, trowels, and finishes concrete.
Data Communication/Telecom Installer	Worker who installs data/telephone and television cable and associated equipment and accessories.
Drywall Installer/Ceiling Installer	Worker who installs metal framed walls and ceilings, drywall coverings, ceiling grids and ceilings.
Electrician	Skilled craftsman who installs or repairs electrical wiring and devices. Includes fire alarm systems, and HVAC electrical controls.
Elevator Mechanic	Craftsman skilled in the installation and maintenance of elevators.
Fire Proofing Installer	Worker who sprays or applies fire proofing materials.
Glazier	Worker who installs glass, glazing and glass framing.
Heavy Equipment Operator	Includes but not limited to all Cat tractors, all derrick-powered, all power operated cranes, back hoe, back filler, power operated shovel, winch truck, all trenching machines.
Insulator	Worker who applies, sprays, or installs insulation.
Iron Worker	Skilled craftsman who erects structural steel framing and installs structural concrete Rebar.
Laborer/Helper	Worker qualified for only unskilled or semi-skilled work. Lifting, carrying materials and tools, hauling, digging, clean-up.
Lather/Plasterer	Worker who installs metal framing and lath. Worker who applies plaster to lathing and installs associated accessories.
Light Equipment Operator	Includes but not limited to air compressors, truck crane driver, flex plane, building elevator, form grader, concrete mixer (less than 14 cf), conveyor.
Mason	Craftsman who works with masonry products, stone, brick, block, or any material substituting for those materials and accessories.
Metal Building Assembler	Worker who assembles pre-made metal buildings.
Millwright	Mechanic specializing in the installation of heavy machinery, conveyance, wrenches, dock levelers, hydraulic lifts and align pumps.
Painter/Wall Covering Installer	Worker who prepares wall surfaces and applies paint and/or wall coverings, tape and bedding.
Pipefitter	Trained worker who installs piping systems, chilled water piping and hot water (boiler) piping, pneumatic tubing controls, chillers, boilers, and associated mechanical equipment.
Plumber	Skilled craftsman who installs domestic hot and cold water piping, waste piping, storm system piping, water closets, sinks, urinals and related work.
Rofer	Worker who installs roofing materials, Bitumen (asphalt and cold tar), felts, flashings, all types roofing membranes and associated products.
Sheet Metal Worker	Worker who installs sheet metal products. Roof metal, flashings, and curbs, ductwork, mechanical equipment, and associated metals.
Sprinkler Fitter	Worker who installs fire sprinkler systems and fire protection equipment.
Terrazzo Worker	Craftsman who places and finishes Terrazzo.
Tile Setter	Worker who prepares wall and/or floor surfaces and applies ceramic tiles to these surfaces.
Waterproofor/Caulker	Worker who applies water proofing material to buildings. Products include sealant, caulk, sheet membrane, liquid membranes, sprayed, rolled, or brushed on.

Attachment A
page 2

General Decision Number TX980043

Superseded General Decision No. TX970043

State: TEXAS

Construction Type:

HEAVY

HIGHWAY

County(ies):

BELL

CORYELL

TRAVIS

BEXAR

GUADALUPE

WILLIAMSON

BRAZOS

HAYS

COMAL

MCLENNAN

Heavy (excluding tunnels and dams) and Highway Construction Projects (does not include building structures in residential projects). *NOT TO BE USED FOR WORK ON SEWAGE OR WATER TREATMENT PLANTS OR LIFT/PUMP STATIONS IN BELL, CORYELL, MCLENNAN AND WILLIAMSON COUNTIES.

Modification Number

Publication Date

0

02/13/1998

1

05/22/1998

Attachment B
Page 1

COUNTY(ies):

BELL	CORYELL	TRAVIS
BEXAR	GUADALUPE	WILLIAMSON
BRAZOS	HAYS	
COMAL	MCLENNAN	

* SUTX2042A 03/26/1998

	Rates	Fringes
AIR TOOL OPERATOR	8.58	
ASPHALT HEATER OPERATOR	11.00	
ASPHALT RAKER	8.00	
ASPHALT SHOVELER	7.97	
BATCHING PLANT WEIGHER	11.00	
CARPENTER	10.80	
CONCRETE FINISHER-PAVING	9.57	
CONCRETE FINISHER-STRUCTURES	8.83	
CONCRETE RUBBER	8.52	
ELECTRICIAN	16.25	
FLAGGER	6.86	
FORM BUILDER-STRUCTURES	8.77	
FORM LINER-PAVING & CURB	8.00	
FORM SETTER-PAVING & CURB	8.68	
FORM SETTER-STRUCTURES	8.73	
LABORER-COMMON	7.12	
LABORER-UTILITY	7.99	
MECHANIC	12.15	
OILER	11.40	
SERVICER	8.44	
PAINTER-STRUCTURES	10.00	
PIPE LAYER	8.27	
ASPHALT DISTRIBUTOR OPERATOR	9.70	
ASPHALT PAVING MACHINE	9.26	
BROOM OR SWEEPER OPERATOR	7.12	
BULLDOZER	9.28	
CONCRETE CURING MACHINE	7.79	
CONCRETE FINISHING MACHINE	11.00	
CONCRETE PAVING SAW	9.79	
SLIPFORM MACHINE OPERATOR	11.15	
CRANE, CLAMSHELL, BACKHOE, DERRICK, DRAGLINE, SHOVEL	10.12	
FOUNDATION DRILL OPERATOR		
TRUCK MOUNTED	15.00	
FRONT END LOADER	8.66	
HOIST - DOUBLE DRUM & LESS	10.81	
MIXER	7.12	
MIXER - CONCRETE PAVING	11.00	
MOTOR GRADER FINE GRADE	12.37	
MOTOR GRADER	11.14	
PAVEMENT MARKING MACHINE	8.31	
PLANER OPERATOR	15.75	
ROLLER, STEEL WHEEL PLANT-MIX PAVEMENTS	7.73	

TX980043 - 2

05/22/1998

Attachment B
Page 2

ROLLER, STEEL WHEEL OTHER	
FLATWHEEL OR TAMPING	7.33
ROLLER, PNEUMATIC, SELF PROPELLED	7.17
SCRAPERS	8.38
TRACTOR-CRAWLER TYPE	9.40
TRAVELING MIXER	7.92
TRENCHING MACHINE, HEAVY	9.92
WAGON-DRILL/BORING MACHINE	8.00
REINFORCING STEEL SETTER PAVING	14.50
REINFORCING STEEL SETTER	
STRUCTURES	10.61
STEEL WORKER-STRUCTURAL	11.73
SPREADER BOX OPERATOR	8.55
WORK ZONE BARRICADE	8.29
SIGN INSTALLER	7.97
TRUCK DRIVER-SINGLE AXLE LIGHT	8.32
TRUCK DRIVER-SINGLE AXLE HEAVY	7.954
TRUCK DRIVER-TANDEM AXLE SEMI-	
TRAILER	8.02
TRUCK DRIVER-LOWBOY/FLOAT	10.12
WELDER	11.02

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5 (a) (1) (v)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.)

and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.
END OF GENERAL DECISION

DOCUMENT 000107 - SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

A. Landscape Architect:

1. James E. Carrillo
2. RLA No. 1377
3. Responsible for Technical Specifications

Halff Associates, Inc.
4030 W. Braker Lane
Austin, TX 78759
Ph: (512) 777-4600



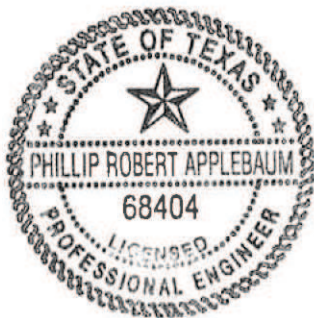
James E. Carrillo, RLA

Date

B. Electrical Engineer:

1. Phillip Applebaum
2. P.E. # 68404
3. Responsible for Technical Specifications

Halff Associates, Inc.
1201 N. Bowser Road
Richardson, TX 75081
Ph: (214) 346-6200
Texas Firm Registration No. F-312



Phillip Applebaum, P.E.

Date

END OF DOCUMENT 000107

DOCUMENT 000108 – TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

000107 Seals Page
000108 Table of Contents
003132 Geotechnical Data
033000 Cast-in-place Concrete
036000 Integral Colored Concrete
044313 Stone Masonry Veneer
047200 Cast Stone Masonry
079200 Joint Sealants
260501 Electrical
310000 Temporary Erosion and Sedimentation Control
311000 Site Clearing
312000 Earth Moving
321400 Unit Paving
329113 Soil Preparation
329200 Turf and Grasses
329300 Plants

END OF DOCUMENT 000108

DOCUMENT 003132 - GEOTECHNICAL DATA

1.1 GEOTECHNICAL DATA

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. A geotechnical investigation report for Project, prepared by Arias & Associates, dated April 22, 2013, is available for viewing as appended to this Document.

Geotechnical Engineering Study

Proposed Gateway Monument Structures Bandera Road City of Leon Valley, Texas

Arias Job No. 2013-70



ARIAS & ASSOCIATES
Geotechnical • Environmental • Testing

**Prepared For
City of Leon Valley
April 22, 2013**



ARIAS & ASSOCIATES

Geotechnical • Environmental • Testing

April 22, 2013
Arias Job No. 2013-70

VIAEmail: kflores@leonvalleytexas.gov

Ms. Kristie M. Flores
Director of Community Development
City of Leon Valley
6400 El Verde Road
Leon Valley, Texas 78238

RE: Geotechnical Engineering Study
Proposed Gateway Monument Structures
City of Leon Valley, Texas

Dear Ms. Flores:

This report presents the results of a Geotechnical Engineering Study for two proposed gateway monument structures to be located in the median of Bandera Road in Leon Valley, Texas. The first gateway monument is located near the intersection of Grass Hill Drive and the second near the intersection of Eckhert road. This study was authorized on March 6, 2013 through signed acceptance of Arias Proposal No. 2013-70, dated January 23, 2013 and revised on March 5, 2013.

The purpose of this geotechnical engineering study was to establish foundation engineering properties of the subsurface soil and groundwater conditions present at the site. The scope of the study is to provide geotechnical engineering criteria for use by design engineers in preparing the foundation designs. Our findings and recommendations should be incorporated into the design and construction documents for the proposed development.

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction to the project plans and specifications. The quality of construction can be evaluated by implementing Quality Assurance (QA) testing. As the Geotechnical Engineer of Record (GER), we recommend that the earthwork and foundation construction be tested and observed by Arias in accordance with the report recommendations. A summary of our qualifications to provide QA testing is discussed in the "Quality Assurance Testing" section of this report. Furthermore, a message to the Owner with regard to QA testing is provided in the ASFE publication included in Appendix E.

Thank you for the opportunity to be of service to you.

Sincerely,
Arias & Associates, Inc.
TBPE Registration No: F-32

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INTRODUCTION

The results of a Geotechnical Engineering Study for the proposed Gateway Monument structures in the City of Leon Valley, Texas are presented in this report. This project was authorized on March 6, 2013 by Ms. Kristie M. Flores representing the City of Leon Valley. Our scope of work was performed in general accordance with the services outlined in Arias Proposal No. 2013-70, dated January 23, 2013 and revised March 5, 2013.

SCOPE OF SERVICES

The purpose of this geotechnical engineering study was to establish engineering properties of the subsurface soil and groundwater conditions present at the site. The scope of the study is sufficient to provide geotechnical engineering criteria for use by design engineers in preparing the monument foundation designs. Environmental studies, pavement engineering or analyses of slopes and/or retaining walls were beyond our authorized scope of services for this project.

PROJECT AND SITE DESCRIPTION

The planned project will consist of the construction of two entrance Gateway Monuments located at the intersections in the grass median of Bandera Road near the intersections of Grass Hill Drive and Eckhert Road in the City of Leon Valley, Texas. A Vicinity Map is included as Figure 1 in Appendix A.

The planned site improvements include the new monuments, flatwork, and landscaping improvements. Preliminary information provided by Halff Associates indicates the self-supported monument structures will weigh approximately 150 to 200 kips. Preliminary plans are to support the monuments on either drilled pier foundations or a shallow concrete mat foundation.

At the time of our study, the proposed monument locations were vacant and vegetated with grass. Site photographs are included as Figure 3 in Appendix A of this report.

SOIL BORINGS AND LABORATORY TESTING

Two (2) soil borings were drilled and sampled at the approximate location shown on the Boring Location Plan provided as Figure 2 in Appendix A. The borings were drilled within the footprint of the proposed monuments at each of the two locations to a depth of approximately 40 feet. The boring depths were measured from below the existing ground surface elevation on March 20, 2013. The borings were sampled in accordance with ASTM D1587 for thin-walled tubes and ASTM D1586 for Split Spoon sampling techniques as described in Appendix C. A truck-mounted drill rig using continuous flight augers together with the sampling tool noted was used to secure the subsurface soil samples.

Soil classifications and borehole logging were conducted during the exploration by an Engineer In Training working under the supervision of our Geotechnical Engineer. Final soil classifications, as seen on the boring logs included in Appendix B, were determined in the laboratory based on laboratory and field test results and applicable ASTM procedures.

As a supplement to the field exploration, laboratory testing was conducted to determine soil water content, Atterberg Limits, and percent passing the US Standard No. 200 sieve. The laboratory results are reported in the attached boring logs included in Appendix B. A key to the terms and symbols used on the logs is also included in Appendix B. The soil laboratory testing for this project was done in accordance applicable ASTM procedures with the specifications and definitions for these tests listed in the Appendix C. Remaining soil samples recovered from this exploration will be routinely discarded following submittal of this report.

SUBSURFACE CONDITIONS

Geology, generalized stratigraphy, and groundwater conditions at the project site are discussed in the following sections. The subsurface and groundwater conditions are based on conditions encountered at the boring location to the depth explored.

Geology

The earth materials underlying the project site have been regionally mapped as the Pecan Gap Chalk Formation (Kpg) from the Late Cretaceous era. The formation is composed primarily of limestone. In Texas, the unit is chalk, with parts clayey and sandy. The surrounding geologic formations are Austin Chalk (Kau) with some Fluvial terrace deposits. Locally, the materials encountered in the test borings consisted of clays with trace sand and very hard Marlstone. A geologic map of the project location is located in Appendix A as Figure 4.

Site Stratigraphy and Engineering Properties

The generalized subsurface stratigraphy encountered in the borings varied slightly between the two locations. The soils encountered in each of the soil borings are summarized in the following tables.

Table 1: Generalized Soil Conditions B-1

Stratum	Depth (ft)	Material Type	PI Range	No. 200 Range	N Range
			PI Average	No. 200 Average	N Average
FILL	0 To 5	CLAYEY SAND with Gravel (SC), dark brown, stiff	31	42	12-18
					15
I	5 to 13	Sandy FAT CLAY (CH), with some Gravel, dark brown, stiff to very stiff	31	42-59	12-20
			31	51	16
II	13 to 18	LEAN CLAY with Sand (CL), with calcareous nodules, light tan, very stiff	23	51	15
			23	51	15
III	18 to 40	MARLSTONE, very hard, light tan, with cemented seams	--	--	50/4" – **10/0"
			--	--	

Where: Depth - Depth from existing ground surface at the time of geotechnical study, feet
 PI - Plasticity Index, %
 No. 200 - Percent passing #200 sieve, %
 N - Standard Penetration Test (SPT) value, blows per foot
 ** - Blow Counts During Seating Penetration

Table 2: Generalized Soil Conditions B-2

Stratum	Depth (ft)	Material Type	PI Range	No. 200 Range	N Range
			PI Average	No. 200 Average	N Range
FILL	0 to 5	FAT CLAY with Sand (CH), dark brown, very stiff	31	77	--
			31	77	
I	5 to 18	FAT CLAY with Sand(CH), some calcareous nodules, light tan, hard to very hard	31	82-97	24 – 50/3"
			31	90	
III	18 to 28	MARLSTONE, very hard, light tan, with cemented seams	--	--	**50/3" – **50/2'
			--	--	
II	28 to 40	LEAN CLAY with Sand (CL), tan and gray, very hard	26-29	83-86	50/5" – **50/6"
			28	85	

Where:	Depth	-	Depth from existing ground surface at the time of geotechnical study, feet
	PI	-	Plasticity Index, %
	No. 200	-	Percent passing #200 sieve, %
	N	-	Standard Penetration Test (SPT) value, blows per foot
	**	-	Blow Counts During Seating Penetration

Groundwater

A dry soil sampling method was used to obtain the soil samples at the project site. Groundwater was not encountered within the test borings during the soil sampling activities which were performed on March 20, 2013. The open boreholes were backfilled using soil cuttings generated from the drilling process.

Groundwater levels will often change significantly over time and should be verified immediately prior to construction. Water levels in open boreholes may require several hours to several days to stabilize depending on the permeability of the soils. Groundwater levels at this site may differ during construction because fluctuations in groundwater levels can result from seasonal conditions, rainfall, drought, or temperature effects. Pockets or seams of gravels, sands, silts or open fractures and joints can store and transmit “perched” groundwater flow or seepage.

IBC Site Classification and Seismic Design Coefficients

Section 1613 of the International Building Code (2012) requires that every structure be designed and constructed to resist the effects of earthquake motions, with the seismic design category to be determined in accordance with Section 1613 or ASCE 7. Site classification according to the International Building Code (2012) is based on the soil profile encountered to 100-foot depth. The stratigraphy at the site location was explored to a maximum 40-foot depth.

Clay soils and Marlstone having similar consistency were extrapolated to be present between 40 and 100-foot depths. On the basis of the site class definitions included in Table 1613.5.2 and 1613.5.5 of the 2012 Code and the encountered generalized stratigraphy, we characterize the site as Site Class C.

Seismic design coefficients were determined using the on-line software, Seismic Hazard Curves and Uniform Response Spectra, version 5.1.0, dated February 10, 2011 accessed at (<http://earthquake.usgs.gov/hazards/designmaps/javacalc.php>). Analyses were performed considering the 2012 International Building Code. Input included zip code 78238 and Site Class C. Seismic design parameters for the site are summarized in the following table.

Table 3: Seismic Design Parameters

Site Classification	F _a	F _v	S _s	S ₁
C	1.2	1.7	0.102g	0.027g

Where: Fa = Site coefficient
Fv = Site coefficient
Ss = Mapped spectral response acceleration for short periods
S₁ = Mapped spectral response acceleration for a 1-second period

MOISTURE VARIATIONS AND ESTIMATED MOVEMENT

Structural damage can be caused by volume changes in clay soils. Clays can shrink when they lose water and swell (grow in volume) when they gain water. The potential for expansive clays to shrink and swell is typically related to the Plasticity Index (PI). Clays with a higher PI generally have a greater potential for soil volume changes due to moisture content variations. The soils found at this site are capable of swelling and shrinking in volume dependent on potentially changing soil water content conditions during or after construction. The term swelling soils implies not only the tendency to increase in volume when water is available, but also to decrease in volume or shrink if water is removed.

The near-surface soil samples at this site have plasticity index values of approximately 31 which suggest that the soils have a high potential for shrinking and swelling due to fluctuations in soil moisture content, especially considering the very dry soil moisture content of the upper soils. We have estimated potential heave for this site utilizing the TXDOT method (Tex 124-E). Using the TXDOT method, we estimate that the PVR is approximately **3 to 3 ½ inches** at each site considering the existing soil moisture conditions at the time of the sampling activities.

It has been our experience that the PVR method can sometimes underestimate the potential shrink/swell movements. Fluctuations in the soil moisture content generated from climatic conditions (*i.e.*, droughts or floods) or as a result of development (*e.g.*, irrigation of landscaping in the immediate vicinity of the building, poor surface drainage, leaking plumbing or water lines) may result in greater shrink/swell movements than calculated.

FOUNDATION DESIGN CONSIDERATIONS

Both shallow and deep foundation types are utilized in this area. Deep drilled piers are suited for structures with moderate to heavy loading conditions, or for more movement-sensitive structures. The piers, when properly founded, can reduce foundation movement of the superstructure. Grade beams, isolated from the soil, typically span between the piers and either a structurally suspended slab or soil supported slab-on-grade is used at the ground floor level. The structurally suspended slab option is used when excellent

performance is expected from the structure in terms of minimal aesthetic distress, such as floor tile, foundation and wall cracking.

A shallow foundation type consisting of a mat foundation, also referred as raft foundation, is a common alternate approach to support structures. This foundation type is typically used for moderate to heavy loading conditions and can be more cost-effective than a deep foundation system. When founded within expansive soils, subgrade improvement is recommended in order to reduce potential soil and foundation movement to a magnitude acceptable to the owner and design team. However, the owner and design team should be cognizant of the risk for some aesthetic distress (floor tile, foundation movement and cracking, and wall cracking) to develop when selecting this foundation alternative. This potential foundation movement may become an operational nuisance and require periodic maintenance and repair to the structure.

Each approach has its advantages and disadvantages in terms of cost and overall performance. If the risks for expansive soil-related foundation movement and aesthetic distress cannot be accepted, a structurally suspended floor system supported on deep drilled pier foundations should be used. We can provide recommendations for this type of foundation system if desired.

The project structural engineer has requested site preparation recommendations to provide a design PVR of 1-inch for a grade supported foundation. Although this is a typically acceptable magnitude of movement in this area, it should be understood shrink/swell movements can result in some aesthetic cracking requiring periodic maintenance; but the structural integrity of the foundations should be maintained. The total and differential foundation movements could exceed the design PVR, particularly resulting from extreme climatic conditions (i.e. drought or floods), excessive irrigation of landscaping on or up-gradient from the building site, poor surface drainage, and/or leaking water lines or plumbing.

Undercut & Replace Method

It is a typical practice in the San Antonio, Texas area to remove a portion of the expansive soils and replace them with select structural fill. This process is known as the “undercut and replace” method. The highly expansive clays found in the proposed gateway monument sites require subgrade modification in order to reduce the potential shrink/swell movements to less than 1 inch. To achieve a reduced PVR of approximately 1 inch for the proposed Leon Valley Gateway Monuments, we recommend that the existing soils in those specific areas be undercut to a depth of at least 7 feet to allow for the placement of a select fill foundation pad. Undercutting should be measured from below the grade that existed on March 20, 2013. The undercut should extend at least 3 feet beyond the monument perimeter and should also encompass any adjacent flatwork. A 4 inch thick seal slab should be placed on top of the exposed subgrade in order to protect the subgrade from moisture infiltration during and after construction. After placement of the seal-slab, the excavation should be

backfilled with compacted lifts of select structural fill to provide a foundation pad beneath the planned concrete mat foundation. The monument perimeter should be completely surrounded by pavement, pavers or other flatwork to minimize the potential for water infiltration under the foundation and to maintain moisture stability along the perimeter of the foundation.

Table 4: Undercut & Replace Method for Each Site

Site Improvement Method:	Undercut & Replace with Imported Select Fill
Desired Improved Site Condition (PVR):	1 inch
Minimum Undercut Depth:	7 feet
Minimum Select Fill Thickness:	7 feet
Lean Concrete Seal Slab Thickness	4 inches
Select Fill Type	Pit Run, PI range 12-20, At least 40% passing No. 200 Or TxDOT Item 247, Type A Grade 1 or 2 Crushed Limestone Material
Moisture Barrier:	See Note 7

Notes:

1. The monument structure requires a minimum of 7 feet undercut and 7 feet of imported select fill to reduce potential shrink/swell movements and reduce potential for cracking.
2. Following stripping operations, the existing soils in area of the planned flatwork should be undercut (over-excavated) as noted in Table 4 to allow for the placement of the minimum amount of select fill shown for the desired design PVR.
3. Undercutting should extend laterally to provide at least a 3-foot overbuild beyond the structure perimeter and to the width of any adjacent sidewalks or flatwork.
4. A 4 inch seal slab should be placed on top of the exposed subgrade.
5. After installing the seal slab, imported select fill should be placed in maximum 8 inch loose lifts as specified in Table 7 (Project Compaction, Moisture and Testing Requirements). The select fill should be placed within 48 hours of completion of the subgrade compaction.
6. If additional fill is required to increase site grades, we recommend that select structural fill be used to raise site grades.
7. We recommend a clay cap be installed around the proposed monument structures to minimize the potential of moisture from infiltrating under the foundation.

Mat Foundation

A mat foundation can be used to support the planned monument structures. The foundation being considered to provide support for the proposed monument should be designed with an appropriate factor of safety to reduce the possibility of soil failure when subjected to axial and lateral loads. Furthermore, foundation movements must be within allowable/tolerable limits of the soil and structure. We recommended that the resultant load be situated in the middle

one-third of the mat foundation. Maximum edge bearing pressures should be limited to the recommended allowable net bearing pressure indicated in this report.

A mat foundation may be used for the proposed monument provided the measures to reduce soil moisture change are implemented as outlined in the previous report sections. A mat foundation to support the monuments can be designed for a net allowable soil bearing pressure of **3,000 psf** for a mat bearing at least 3 feet below the final grade. The provided allowable bearing pressure includes a factor of safety against bearing capacity failure of at least 3. The modulus of the subgrade reaction for the compacted fill can be taken as $k = 100$ pci.

In addition to axial and lateral loading conditions, the monument will need to be designed to resist overturning moments due to the height of the structure. Overturning moments can be resisted by the weight of the foundation, the sustained weight/load from the structure, and any soil overlying the foundation. A soil unit weight of 125 pounds per cubic foot (pcf) may be assumed for onsite soils or select fill that is placed above the foundation. Soil placed above the foundation should be placed in maximum 8-inch loose lifts that are moisture conditioned to between -2 and +3 percentage points of optimum moisture content and compacted to at least 95 percent of the maximum dry density determined by ASTM D 698.

Lateral loads can be resisted by using an allowable passive pressure of **500 psf** acting on the side (*i.e.*, the face) of the mat foundation. The allowable passive pressure includes a factor of safety of at least 2. An ultimate coefficient of friction across the footing foundation base of 0.35 can also be used to aid in the resistance of lateral loads.

Design Measures to Reduce Changes in Soil Moisture

Measures to reduce future moisture fluctuations of the soils under the planned site structures must be considered. Movements of foundation soil can be effectively reduced by providing horizontal and/or vertical moisture barriers around the edge of the slab. Typically the moisture barriers would consist of concrete flatwork or asphalt or concrete pavement placed adjacent to the edge of the structures. The planned flatwork provided in the walk-around area of the monument will provide perimeter moisture protection for the planned monuments.

If the planned shrink/swell movements in the planned flatwork areas are not acceptable, we recommend that subgrade modification through excavation and replacement be provided to reduce potential soil-related foundation movements. The design and construction of a grade-supported flatwork and foundations should also include the following elements:

- Hose bibs, sprinkler heads, and other external water connections should be placed well away from the foundation perimeter such that surface leakage cannot readily infiltrate

into the subsurface or compacted fills placed under the proposed foundations and slabs.

- No trees or other vegetation over 6 feet in height shall be planted within 15 feet of the structure unless specifically accounted for in the foundation design.
- Utility bedding should not include gravel within 4 feet of the perimeter of the foundation. Compacted clay or flowable fill trench backfill should be used in lieu of permeable bedding materials between 2 feet inside the building to a distance of 4 feet beyond the exterior of the building edge to reduce the potential for water to infiltrate within utility bedding and backfill material.
- Paved areas around the structure are helpful in maintaining equilibrium within the soil water content. If not paved areas are planned around the monument, a clay cap should be installed to aid in moisture protection.
- Flower beds and planter boxes should be piped or water tight to prevent water infiltration under the building. Experience indicates that landscape irrigation is a common source of foundation movement problems and pavement distress.
- Site work excavations should be protected and backfilled without delay to reduce changes in the natural moisture regime.

CONSTRUCTION CRITERIA

Site Preparation

Strip away any existing topsoil, grass, organics, and deleterious debris as needed and dispose outside of the monument structural areas. Undercut to the required depth and extent as noted in the main report. Additional excavation may be required to accommodate the required select fill thickness, or as required, to remove existing utilities or foundations. Additional excavation may also be necessary due to encountering deleterious materials such as buried debris and/or rubble, or undesirable soft and wet subgrade conditions. The site representative of the geotechnical engineer should observe undercutting operations. Unless passing density reports are provided for a specific area, existing fill soils found during the excavation should be considered as uncertified and removed to suitable natural soils.

Table 5: Project Compaction, Moisture and Testing Requirements

Description	Material	Percent Compaction	Optimum Moisture Content	Testing Requirement
		According to Standard Proctor ASTM D 698		
Structural Areas	Subgrade soil at base of excavation	93% to 98%	0 to +4%	1 per 5,000 SF
	Select Fill (Pit Run or Crushed Limestone Base)	≥ 98%	-2 to +3%	1 per 5,000 SF; min. 3 per lift
Non-Structural Areas (Outside Building Pad)	General Fill (On-site Material)	≥ 95%	0 to +4%	1 per 5,000 SF; min. 3 per lift

Drainage

Good positive drainage during and after construction is very important to reduce expansive soil volume changes that can detrimentally affect the performance of the planned development. Proper attention to surface and subsurface drainage details during the design and construction phase of development can aid in preventing many potential soil shrink-swell related problems during and following the completion of the project.

Earthwork and Foundation Acceptance

Exposure to the environment may weaken the soils at the foundation bearing level if the excavation remains open for long periods of time. Therefore, it is recommended that all foundation excavations be extended to final grade and constructed as soon as possible in order to reduce potential damage to the bearing soils. If bearing soils are exposed to severe drying or wetting, the unsuitable soil must be re-conditioned or removed as appropriate and replaced with compacted fill, prior to concreting. The foundation bearing level should be free of loose soil, ponded water or debris and should be observed prior to concreting by the geotechnical engineer or his representative.

Foundation concrete should not be placed on soils that have been disturbed by rainfall or seepage. If the bearing soils are softened by surface water intrusion during exposure or by desiccation, the unsuitable soils must be removed from the foundation excavation and replaced with compacted select fill prior to placement of concrete.

Subgrade preparation and fill placement operations should be monitored by the soil engineer or his representative. As a guideline, at least one in-place density test should be performed for each 5,000 sq. ft. of compacted surface per lift or a minimum of three tests per lift. Any areas not meeting the required compaction should be recompacted and retested until compliance is met.

Trench Excavations

Excavations should comply with OSHA Standard 29CFR, Part 1926, Subpart P and all State of Texas and local requirements. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer. A trench is defined as a narrow excavation in relation to its depth. In general, the depth is greater than the width, but the bottom width of the trench is not greater than 15 feet. Trenches greater than 5 feet in depth require a protective system such as trench shields, trench shoring, or sloping back the excavation side slopes.

The Contractor's "Competent Person" shall perform daily inspections of the trench to verify that the trench is properly constructed and that surcharge and vibratory loads are not excessive, that excavation spoils are sufficiently away from the edge of the trench, proper ingress and egress into the trench is provided and all other items are performed as outlined in these OSHA regulations. It is especially important for the inspector to observe the effects of changed weather conditions, surcharge loadings, and cuts into adjacent backfills of existing utilities. The flow of water into the base and sides of the excavation and the presence of any surface slope cracks should also be carefully monitored by the Trench Safety Engineer.

Although the geotechnical report provides an indication of soil types to be anticipated, actual soil and groundwater conditions will vary along the trench route. The "Competent Person" must evaluate the soils and groundwater in the trench excavation at the time of construction to verify that proper sloping or shoring measures are performed.

Appendix B to the OSHA regulations has sloping and benching requirements for short-term trench exposure for various soil types up to the maximum allowable 20-foot depth requirement.

GENERAL COMMENTS

The scope of this study is to provide geotechnical engineering criteria for use by design engineers in preparing the foundation designs. Environmental studies of any kind were not a part of our scope of work or services even though we are capable of providing such services.

This report was prepared as an instrument of service for this project exclusively for the use of the City of Leon Valley and the project design team. If the development plans change relative to monument or overall site layout, size, or anticipated loads or if different subsurface conditions are encountered, we should be informed and retained to ascertain the impact of these changes on our recommendations. We cannot be responsible for the potential impact of these changes if we are not informed.

Geotechnical Design Review

Arias should be given the opportunity to review the design and construction documents. The purpose of this review is to check to see if our geotechnical recommendations are properly interpreted into the project plans and specifications. Please note that design review was not included in the authorized scope and additional fees may apply.

Subsurface Variations

Soil and groundwater conditions may vary between the sample boring locations. Transition boundaries or contacts, noted on the boring logs to separate soil types, are approximate. Actual contacts may be gradual and vary at different locations. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions or highly variable subsurface conditions are encountered during construction, we should be contacted to evaluate the significance of the changed conditions relative to our recommendations.

Quality Assurance Testing

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction to the project plans and specifications. As Geotechnical Engineer of Record (GER), we should be engaged by the Owner to provide Quality Assurance (QA) testing. Our services will be to evaluate the degree to which constructors are achieving the specified conditions they're contractually obligated to achieve, and observe that the encountered materials during earthwork for foundation and pavement installation are consistent with those encountered during this study. In the event that Arias is not retained to provide QA testing, we should be immediately contacted if differing subsurface conditions are encountered during construction. Differing materials may require modification to the recommendations that we provided herein. A message to the Owner with regard to the project QA is provided in the ASFE publication included in Appendix E.

Arias has an established in-house laboratory that meets the standards of the American Standard Testing Materials (ASTM) specifications of ASTM E-329 defining requirements for Inspection and Testing Agencies for soil, concrete, steel and bituminous materials as used in construction. We maintain soils, concrete, asphalt, and aggregate testing equipment to provide the testing needs required by the project specifications. All of our equipment is calibrated by an independent testing agency in accordance with the National Bureau of Standards. In addition, Arias is accredited by the American Association of State Highway & Transportation Officials (AASHTO), the United States Army Corps of Engineers (USACE) and the Texas Department of Transportation (TxDOT), and also maintains AASHTO Materials Reference Laboratory (AMRL) and Cement and Concrete Reference Laboratory (CCRL) proficiency sampling, assessments and inspections.

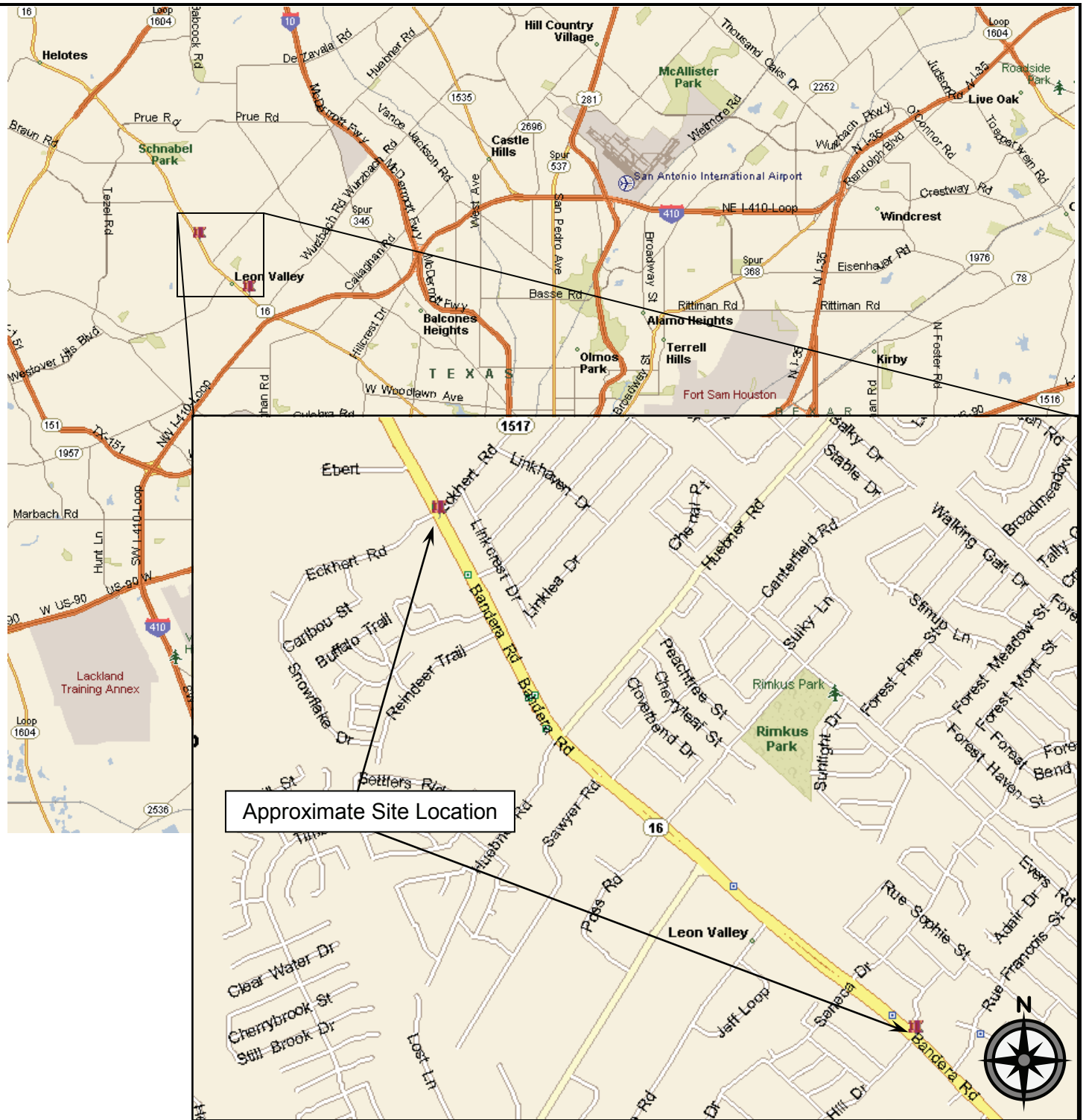
Furthermore, Arias employs a technical staff certified through the following agencies: the National Institute for Certification in Engineering Technologies (NICET), the American

Concrete Institute (ACI), the American Welding Society (AWS), the Precast/Prestressed Concrete Institute (PCI), the Mine & Safety Health Administration (MSHA), the Texas Asphalt Pavement Association (TXAPA) and the Texas Board of Professional Engineers (TBPE). Our services are conducted under the guidance and direction of a Professional Engineer (P.E.) licensed to work in the State of Texas, as required by law.

Standard of Care

Subject to the limitations inherent in the agreed scope of services as to the degree of care and amount of time and expenses to be incurred, and subject to any other limitations contained in the agreement for this work, Arias has performed its services consistent with that level of care and skill ordinarily exercised by other professional engineers practicing in the same locale and under similar circumstances at the time the services were performed. Information about this geotechnical report is provided in the ASFE publication included in Appendix D.

APPENDIX A: FIGURES AND SITE PHOTOGRAPHS



ARIAS & ASSOCIATES, INC.

Geotechnical • Environmental • Testing
TBPE Registration No. F-32

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San Antonio, Texas 78232
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VICINITY MAP

Proposed Leon Valley Gateway Monuments
Bandera Road
City of Leon Valley, Texas

Date: April 22, 2013

Drawn By: LP

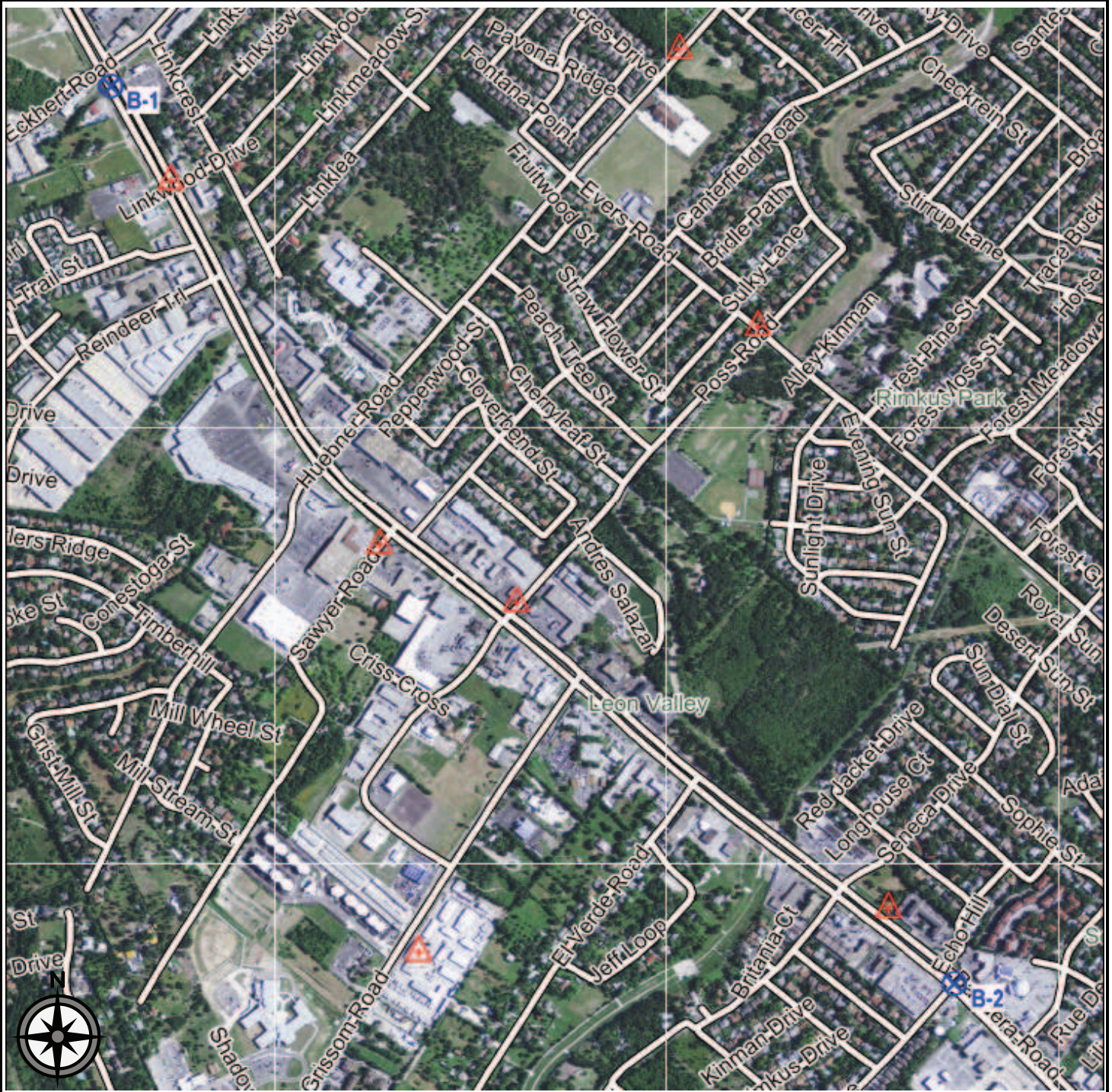
Approved By: RG

Job No.: 2013-70

Checked By: TAS

Scale: N.T.S.

Figure 1



ARIAS & ASSOCIATES, INC.

Geotechnical • Environmental • Testing
TBPE Registration No. F-32

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BORING LOCATION PLAN

Proposed Leon Valley Gateway Monuments
Bandera Road
City of Leon Valley, Texas

REVISIONS:

No.:	Date:	Description:
B-1	3/20/2013	40 Foot Boring
B-2	3/20/2013	40 Foot Boring

Date: April 22, 2013

Drawn By: LP

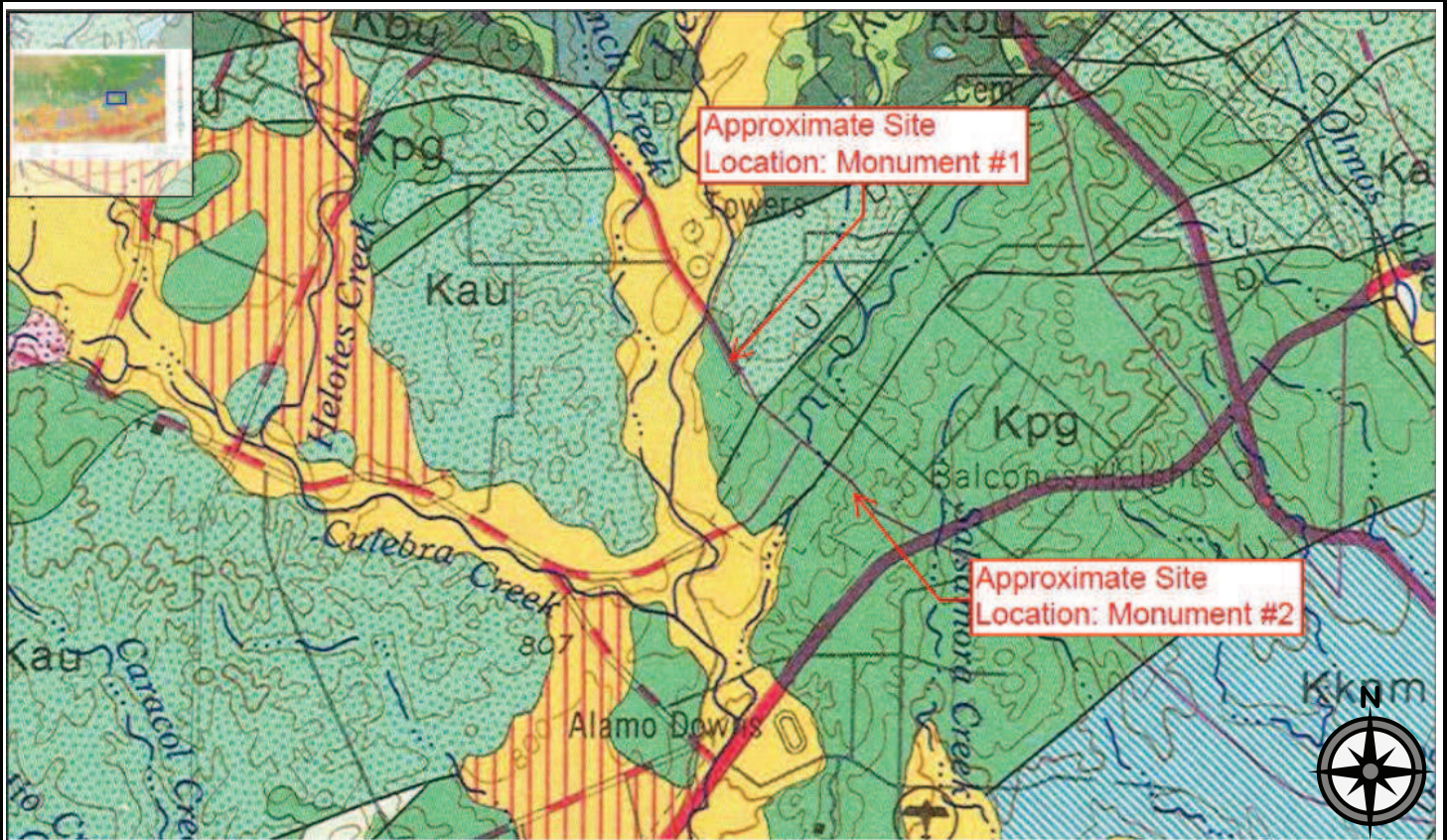
Approved By: RG

Job No.: 2013-70

Checked By: TAS

Scale: N.T.S.

Figure 2



Kpg – Pecan Gap Chalk

Kau – Austin Chalk

Qt – Fuvatile Terrace Deposits

Kbu – Buda Limestone



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GEOLOGIC MAP

Proposed Leon Valley Gateway Monuments
Bandera Road
City of Leon Valley, Texas

Date: April 22, 2013

Job No.: 2013-70

Drawn By: LP

Checked By: TAS

Approved By: RG

Scale: N.T.S.

Figure 3



Drilling B-1 Looking North-West



Drilling B-1 Viewing East



Drilling B-1 Looking North-West



Drilling B-1 Viewing East



ARIAS & ASSOCIATES, INC.

Geotechnical • Environmental • Testing
TBPE Registration No. F-32

142 Chula Vista
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SITE PHOTOS

Proposed Leon Valley Gateway Monuments
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City of Leon Valley, Texas

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Scale: N.T.S.

Figure 4

APPENDIX B: SOIL BORING LOGS AND KEY TO TERMS

Boring Log No. B-1



Project: **Leon Valley Monuments**
Bandera Road
Leon Valley, Texas

Sampling Date: 3/20/13

Coordinates: N29°30'23.5" W98°37'42.6"

Location: See Boring Location Plan

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
CLAYEY SAND with Gravel (SC), stiff, dark brown, (possible fill)	0 - 5	SS	16	22	53	31	12	
	5 - 10	SS	11	21	52	31	18	42
SANDY FAT CLAY (CH), stiff to very stiff, dark brown, with some gravel	10 - 15	SS	6				20	
	15 - 20	SS	13				13	
	20 - 25	SS	34	24	57	33	12	59
	25 - 30	SS	30				20	
LEAN CLAY with Sand (CL), stiff, tan, with calcareous nodules	30 - 35	SS	9	17	40	23	15	51
MARLSTONE, very hard, light tan, with cemented seams and layers	35 - 38.6	SS	13				**10/0"	
		SS	11				50/4"	
		SS	10				**10/1"	66
		SS	11				11	
Borehole terminated at 38.6 feet		SS	8				**10/0"	

Groundwater Data:


During drilling: Not encountered

Field Drilling Data:

Coordinates: Hand-held GPS Unit
 Logged By: L. Perez
 Driller: Accu Drilling
 Equipment: Truck-mounted drill rig

Single flight auger: 0 - 38.6 ft

Nomenclature Used on Boring Log

 Split Spoon (SS)

WC = Water Content (%)
 PL = Plastic Limit
 LL = Liquid Limit
 PI = Plasticity Index
 N = SPT Blow Count

** = Blow Counts During Seating
 Penetration
 -200 = % Passing #200 Sieve

2013-70.GPJ 4/18/13 (BORING LOG SA12-02, AR/ASSA12-01, GDT, LIBRARY2012-02, GLB)

Boring Log No. B-2



Project: **Leon Valley Monuments**
Bandera Road
Leon Valley, Texas

Sampling Date: 3/20/13

Coordinates: N29°29'21.8" W98°36'37.9"

Location: See Boring Location Plan

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	PP	N	-200
FILL: FAT CLAY with Sand (CH), dark brown, with gravel -tan, gravelly clay below 2'		T	13	22	53	31	4.5+		77
		T	19				4.5+		
FAT CLAY (CH), very hard, light tan, with sand -tan, with ferrous deposits at 12'	5	SS	12	22	53	31		59	82
		SS	11					**50/3"	
	10	SS	11					**50/4"	
		SS	29					24	
	15	SS	23	21	52	31		28	97
MARLSTONE, very hard, light tan, cemented	20	SS	14					**50/3"	
	25	SS	13					**25/2"	
LEAN CLAY with Sand (CL), very hard, tan and gray	30	SS	14	17	43	26		**50/5"	83
	35	SS	17					50/5"	
Borehole terminated at 39 feet									
		SS	16	21	50	29		**50/6"	86

Groundwater Data:

During drilling: Not encountered

Field Drilling Data:

Coordinates: Hand-held GPS Unit
 Logged By: L. Perez
 Driller: Accu Drilling
 Equipment: Truck-mounted drill rig

Single flight auger: 0 - 39 ft

Nomenclature Used on Boring Log

■ Thin-walled tube (T)

■ Split Spoon (SS)

WC = Water Content (%)






















PL = Plastic Limit

LL = Liquid Limit

PI = Plasticity Index

N = SPT Blow Count
 ** = Blow Counts During Seating Penetration
 -200 = % Passing #200 Sieve
 PP = Pocket Penetrometer (tsf)

KEY TO CLASSIFICATION SYMBOLS USED ON BORING LOGS

MAJOR DIVISIONS			GROUP SYMBOLS		DESCRIPTIONS
COARSE-GRAINED SOILS More Than Half of Material LARGER Than No. 200 Sieve size	GRAVELS More Than Half of Coarse Fraction is LARGER Than No. 4 Sieve Size	Clean Gravels (Little or no Fines)	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
			GP		Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
		Gravels With Fines (Appreciable Amount of Fines)	GM		Silty Gravels, Gravel-Sand-Silt Mixtures
			GC		Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS More Than Half of Coarse Fraction is SMALLER Than No. 4 Sieve Size	Clean Sands (Little or no Fines)	SW		Well-Graded Sands, Gravelly Sands, Little or no Fines
			SP		Poorly-Graded Sands, Gravelly Sands, Little or no Fines
		Sands With Fines (Appreciable Amount of Fines)	SM		Silty Sands, Sand-Silt Mixtures
			SC		Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS More Than Half of Material is SMALLER Than No. 200 Sieve Size	SILTS & CLAYS	Liquid Limit Less Than 50	ML		Inorganic Silts & Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
			CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
	SILTS & CLAYS	Liquid Limit Greater Than 50	MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils, Elastic Silts
			CH		Inorganic Clays of High Plasticity, Fat Clays
FORMATIONAL MATERIALS	SANDSTONE			Massive Sandstones, Sandstones with Gravel Clasts	
	MARLSTONE			Indurated Argillaceous Limestones	
	LIMESTONE			Massive or Weakly Bedded Limestones	
	CLAYSTONE			Mudstone or Massive Claystones	
	CHALK			Massive or Poorly Bedded Chalk Deposits	
	MARINE CLAYS			Cretaceous Clay Deposits	
	GROUNDWATER			Indicates Final Observed Groundwater Level	
				Indicates Initial Observed Groundwater Location	

APPENDIX C: FIELD AND LABORATORY EXPLORATION

FIELD AND LABORATORY EXPLORATION

The field exploration program included drilling at selected locations within the site and intermittently sampling the encountered materials. The boreholes were drilled using single flight auger (ASTM D 1452). Samples of encountered materials were obtained using a split-barrel sampler while performing the Standard Penetration Test (ASTM D 1586), or by taking material from the auger as it was advanced (ASTM D 1452). The sample depth interval and type of sampler used is included on the soil boring log. Arias' field representative visually logged each recovered sample and placed a portion of the recovered sample into a plastic bag for transport to our laboratory.

SPT N-values and blow counts for those intervals where the sampler could not be advanced for the required 18-inch penetration are shown on the soil boring log. If the test was terminated during the 6-inch seating interval or after 10 hammer blows were applied and no advancement of the sampler was noted, the log denotes this condition as blow count during seating penetration.

Arias performed soil mechanics laboratory tests on selected samples to aid in soil classification and to determine engineering properties. Tests commonly used in geotechnical exploration, the method used to perform the test, and the column designation on the boring log where data are reported are summarized as follows:

Test Name	Test Method	Log Designation
Water (moisture) content of soil and rock by mass	ASTM D 2216	wc
Liquid limit, plastic limit, and plasticity index of soils	ASTM D 4318	PL, LL, PI
Amount of material in soils finer than the No. 200 sieve	ASTM D 1140	-200

The laboratory results are reported on the soil boring log.

APPENDIX D: ASFE INFORMATION – GEOTECHNICAL REPORT

Important Information about Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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APPENDIX E: QUALITY ASSURANCE TESTING

A Message to Owners

Construction materials engineering and testing (CoMET) consultants perform quality-assurance (QA) services to evaluate the degree to which constructors are achieving the specified conditions they're contractually obligated to achieve. Done right, QA can save you time and money; prevent unanticipated-conditions claims, change orders, and disputes; and reduce short-term and long-term risks, especially by detecting molehills before they grow into mountains.

Done right, QA can save you time and money; prevent claims and disputes; and reduce risks. Many owners don't do QA right because they follow bad advice.

Many owners don't do QA right because they follow bad advice; e.g., "CoMET consultants are all the same. They all have accredited facilities and certified personnel. Go with the low bidder." But there's no such thing as a standard QA scope of service, meaning that – to bid low – each interested firms *must* propose the cheapest QA service it can live with, jeopardizing service quality and aggravating risk for the entire project team. Besides, the advice is based on misinformation.

Fact: ***Most CoMET firms are not accredited***, and the quality of those that are varies significantly. Accreditation – which is important – nonetheless means that a facility met an accrediting body's minimum criteria. Some firms practice at a much higher level; others just barely scrape by. And what an accrediting body typically evaluates – management, staff, facilities, and equipment – can change substantially before the next review, two, three, or more years from now.

Most CoMET firms are not accredited. It's dangerous to assume CoMET personnel are certified.

Fact: ***It's dangerous to assume CoMET personnel are certified***. Many have no credentials at all; some are certified by organizations of questionable merit, while others have a valid certification, but *not* for the services they're assigned.

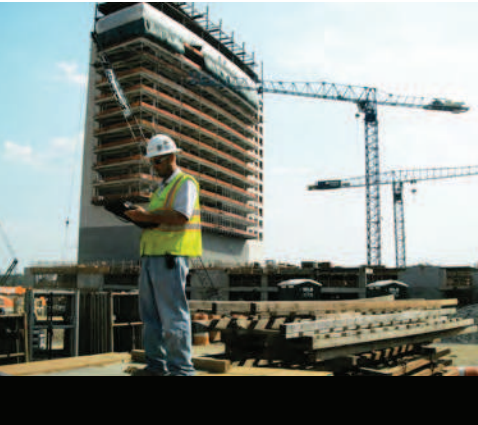
Some CoMET firms – the "low-cost providers" – *want* you to believe that price is the only difference between QA providers. It's not, of course. Firms that sell low price typically lack the facilities, equipment, personnel, and insurance quality-oriented firms invest in to achieve the reliability concerned owners need to achieve quality in quality assurance.

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Firms that sell **low price typically lack the facilities, equipment, personnel,** and insurance quality-oriented firms invest in to achieve the reliability concerned owners need to achieve quality in quality assurance.



To derive maximum value from your investment in QA, require the CoMET firm's project manager to serve actively on the project team from beginning to end, a level of service that's relatively inexpensive and can pay huge dividends. During the project's planning and design stages, experienced CoMET professionals can help the design team develop uniform technical specifications and establish appropriate observation, testing, and instrumentation procedures and protocols. They can also analyze plans and specs much as constructors do, looking for the little errors, omissions, conflicts, and ambiguities that often become the basis for big extras and big claims. They can provide guidance about operations that need closer review than others, because of their criticality or potential for error or abuse. They can also relate their experience with the various constructors that have expressed interest in your project.

To derive maximum value, **require the project manager to serve actively** on the project team from beginning to end.

CoMET consultants' construction-phase QA services focus on two distinct issues: those that relate to geotechnical engineering and those that relate to the other elements of construction.

The geotechnical issues are critically important because they are essential to the "observational method" geotechnical engineers use to significantly reduce the amount of sampling they'd otherwise require. They apply the observational method by developing a sampling plan for a project, and then assigning field representatives to ensure

samples are properly obtained, packaged, and transported. The engineers review the samples and, typically, have them tested in their own laboratories. They use the information they derive to characterize the site's subsurface and develop *preliminary* recommendations for the structure's foundations and for the specifications of various "geo" elements, like excavations, site grading, foundation-bearing grades, and roadway and parking-lot preparation and surfacing.

Geotechnical engineers cannot finalize their recommendations until they or their field representatives are on site to observe what's excavated to verify that the subsurface conditions the engineers predicted are those that actually exist.

When unanticipated conditions are observed, recommendations and/or specifications should be modified.

Responding to client requests, many geotechnical-engineering firms have expanded their field-services mix, so they're able to perform overall construction QA, encompassing – in addition to geotechnical issues – reinforced concrete, structural steel, welds, fireproofing, and so on. Unfortunately, that's caused some confusion. Believing that all CoMET consultants are alike, some owners take bids for the overall CoMET package, including the geotechnical field observation. *Entrusting geotechnical field observation to someone other than the geotechnical engineer of record (GER) creates a significant risk.*

Geotechnical engineers cannot finalize their recommendations until they are on site to verify that the subsurface conditions they predicted are those that actually exist. **Entrusting geotechnical field observation to someone other than the geotechnical engineer of record (GER) creates a significant risk.**

GERs have developed a variety of protocols to optimize the quality of their field-observation procedures. Quality-focused GERs meet with their field representatives before they leave for a project site, to brief them on what to look for and where, when, and how to look. (*No one can duplicate this briefing*, because no one else knows as much about a project's geotechnical issues.) And once they arrive at a project site, the field representatives know to maintain timely, effective communication with the GER, because that's what the GER has trained them to do. By contrast, it's extremely rare for a different firm's field personnel to contact the GER, even when they're concerned or confused about what they observe, because they regard the GER's firm as "the competition."

Divorcing the GER from geotechnical field operations is almost always penny-wise and pound-foolish. Still, because owners are given bad advice, it's commonly done, helping to explain why *"geo" issues are the number-one source of construction-industry claims and disputes.*

Divorcing the GER from geotechnical field operations is almost always penny-wise and pound-foolish, helping to explain why "geo" issues are the number-one source of construction-industry claims and disputes.

To derive the biggest bang for the QA buck, identify three or even four quality-focused CoMET consultants. (If you don't know any,

use the "Find a Geoprofessional" service available free at www.asfe.org.) Ask about the firms' ongoing and recent projects and the clients and client representatives involved; *insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.*

Insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.

Once you identify the two or three most qualified firms, meet with their representatives, preferably at their own facility, so you can inspect their laboratory, speak with management and technical staff, and form an opinion about the firm's capabilities and attitude.

Insist that each firm's designated project manager participate in the meeting. You will benefit when that individual is a seasoned QA professional familiar with construction's rough-and-tumble. Ask about others the firm will assign, too. There's no substitute for experienced personnel who are familiar with the codes and standards involved and know how to:

- read and interpret plans and specifications;
- perform the necessary observation, inspection, and testing;
- document their observations and findings;
- interact with constructors' personnel; and
- respond to the unexpected.

Important: Many of the services CoMET QA field representatives perform – like observing operations and outcomes – require the good judgment afforded by extensive training and experience, especially in situations where standard operating procedures do not apply. You need to know who will be exercising that judgment: a 15-year "veteran" or a rookie?

Many of the services **CoMET QA field representatives perform** **require good judgment.**

Also consider the tools CoMET personnel use. Some firms are passionate about proper calibration; others, less so. Passion is a good thing! Ask to see the firm's calibration records. If the firm doesn't have any, or if they are not current, be cautious. *You cannot trust test results derived using equipment that may be out of calibration.* Also ask a firm's representatives about their reporting practices, including report distribution, how they handle notifications of nonconformance, and how they resolve complaints.

Scope flexibility is needed to deal promptly with the unanticipated.

For financing purposes, some owners require the constructor to pay for CoMET services. ***Consider an alternative approach*** so you don't convert the constructor into the CoMET consultant's client. If it's essential for you to fund QA via the constructor, have the CoMET fee included as an allowance in the bid documents. This arrangement ensures that you remain the CoMET consultant's client, and it prevents the CoMET fee from becoming part of the constructor's bid-price competition. (Note that the International Building Code (IBC) *requires the owner to pay* for Special Inspection (SI) services commonly performed by the CoMET consultant as a service separate from QA, to help ensure the SI services' integrity. Because failure to comply could result in denial of an occupancy or use permit, having a contractual agreement that conforms to the IBC mandate is essential.)

If it's essential for you to fund QA via the constructor, **have the CoMET fee included as an allowance in the bid documents.** Note, too, that the International Building Code (IBC) **requires the owner to pay for Special Inspection (SI) services.**

CoMET consultants can usually quote their fees as unit fees, unit fees with estimated total (invoiced on a unit-fee basis), or lump-sum (invoiced on a percent-completion basis referenced to a schedule of values). No matter which method is used, estimated quantities need to be realistic. Some CoMET firms lower their total-fee estimates by using quantities they know are too low and then request change orders long before QA is complete.

Once you and the CoMET consultant settle on the scope of service and fee, enter into a written contract. Established CoMET firms have their own contracts; most owners sign them. Some owners prefer to use different contracts, but that can be a mistake when the contract was prepared for construction services. *Professional services are different.* Wholly avoidable problems occur when a contract includes provisions that don't apply to the services involved and fail to include those that do.

Some owners create wholly avoidable problems by using a contract prepared for construction services.



PROJECT QUALITY ASSURANCE



This final note: CoMET consultants perform QA for owners, not constructors. While constructors are commonly allowed to review QA reports as a *courtesy*, you need to make it clear that constructors do *not* have a legal right to rely on those reports; i.e., if constructors want to forgo their own observation and testing and rely on results derived from a scope created to meet *only* the needs of the owner, they

must do so at their own risk. In all too many cases where owners have not made that clear, some constructors have alleged that they did have a legal right to rely on QA reports and, as a result, the CoMET consultant – not they – are responsible for their failure to deliver what they contractually promised to provide. The outcome can be delays and disputes that entangle you and all other principal project participants. Avoid that. Rely on a CoMET firm that possesses the resources and attitude needed to manage this and other risks as an element of a quality-focused service. Involve the firm early. Keep it engaged. And listen to what the CoMET consultant says. A good CoMET consultant can provide great value.

For more information, speak with your ASFE-Member CoMET consultant or contact ASFE directly.



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SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Sections:
 - 1. Section 036000 "Integral Colored Concrete"

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.
- C. Steel Reinforcement

1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material test reports.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

- E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I, gray.
 - a. Fly Ash: ASTM C 618, Class F or C.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, graded.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Lightweight Aggregate: ASTM C 330, 3/8-inch nominal maximum aggregate size.
- D. Water: ASTM C 94/C 94M.

2.4 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2.5 CURING MATERIALS

- A. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
- D. Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 3000 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 - 3. Slump Limit: 5 inches, plus or minus 1 inch.
 - 4. Air Content: 4 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 - 5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.8 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.9 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Do not chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Cold-Weather Placement: Comply with ACI 306.1.
- D. Hot-Weather Placement: Comply with ACI 301.

3.6 FINISHING FORMED SURFACES

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.7 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.8 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Owner's approval.

3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

END OF SECTION 033000

SECTION 036000

INTEGRALLY COLORED CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to Work of this Section.
- B. Section Includes:
 - 1. Integrally colored concrete sidewalks and other exterior concrete pavement.
 - 2. Curing of integrally colored concrete.
- C. Related Sections:
 - 1. Section 033000 – Concrete Paving: for general applications of concrete and coordination of sample submittal.
 - 2. Section 079200 – Joint Sealers

1.2 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. ACI 301 "Specification for Structural Concrete for Buildings."
 - 2. ACI 302 IR "Recommended Practice for Concrete Floor and Slab Construction."
 - 3. ACI 303.1 "Standard Specification for Cast-In-Place Architectural Concrete."
 - 4. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete."
 - 5. ACI 305R "Recommended Practice for Hot Weather Concreting."
 - 6. ACI 306R "Recommended Practice for Cold Weather Concreting."
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C309 "Liquid Membrane-Forming Compounds for Curing Concrete."
 - 2. ASTM C494 "Standard Specification for Chemical Admixtures for Concrete."
 - 3. ASTM C979 "Standard Specification for Pigments for Integrally Colored Concrete."
- C. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M194 "Chemical Admixtures."

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's complete technical data sheets for the following:
 - 1. Colored admixture.
 - 2. Curing compound.
- B. Design Mixes: For each type of integrally colored concrete.
- C. Samples for Initial Selection: Manufacturer's color charts showing full range of colors available.

- D. Qualification Data: For firms indicated in "Quality Assurance" Article, including list of completed projects.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with 10-years experience in the production of specified products.
- B. Installer Qualifications: An installer with 5+ years experience with work of similar scope and quality.
- C. Comply with the requirements of ACI 301.
- D. Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project.
- E. Notification of manufacturer's authorized representative shall be given at least 1-week before start of Work.
- F. Integrally Colored Concrete Mockups:
1. Provide under provisions of Division 1 Section "Quality Control."
 2. At location on Project selected by Engineer, place and finish 4 by 4 feet (1.2 by 1.2 m) area.
 3. For accurate color, the quantity of concrete mixed to produce the sample should not be less than 3 cubic yards (or not less than 1/3 the capacity of the mixing drum on the ready-mix truck) and should always be in full cubic yard increments. Excess material shall be discarded according to local regulations.
 4. Construct mockup using processes and techniques intended for use on permanent work, including curing procedures. Include samples of control, construction, and expansion joints in sample panels. Mockup shall be produced by the individual workers who will perform the work for the Project.
 5. Retain samples of cements, sands, aggregates and color additives used in mockup for comparison with materials used in remaining work.
 6. Accepted mockup provides visual standard for work of Section.
 7. Mockup shall remain through completion of work for use as a quality standard for finished work.
 8. Remove mockup when directed.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Colored Admixture: Comply with manufacturer's instructions. Deliver colored admixtures in original, unopened packaging. Store in dry conditions.

1.6 PROJECT CONDITIONS

- A. Integrally Colored Concrete Environmental Requirements:
1. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.
 2. Avoid placing concrete if rain, snow, or frost is forecast within 24-hours. Protect fresh concrete from moisture and freezing.
 3. Comply with professional practices described in ACI 305R and ACI 306R.

- B. Schedule delivery of concrete to provide consistent mix times from batching until discharge. Mix times shall meet manufacturer's written recommendations.

1.7 PRE-JOB CONFERENCE

- A. One week prior to placement of integrally colored concrete a meeting will be held to discuss the Project and application materials.
- B. It is suggested that the Engineer, General Contractor, Subcontractor, Ready-Mix Concrete Representative, and a Manufacturer's Representative be present.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. L.M. SCOFIELD COMPANY, Douglasville, Georgia and Los Angeles, California (800) 800-9900 or the appropriate local contact: Eastern Division – 201-672-9050; Western Division – 714-568-1870; Central Division Office – 630-377-5959.

2.2 MATERIALS

- A. Colored Admixture for Integrally Colored Concrete: CHROMIX P[®] Admixture and CHROMIX ML[®]; L.M. SCOFIELD COMPANY.
 - 1. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are limeproof and ultra-violet resistant.
 - 2. Colored admixture shall conform to the requirements of ACI 303.1, ASTM C979, ASTM C494 and ASSHTO M194.
- B. Curing Compound for Integrally Colored Concrete: Curing compound shall comply with ASTM C309 and be of same manufacturer as colored admixture, for use with integrally colored concrete.
 - 1. Exterior Integrally Colored Concrete: LITHOCHROME[®] COLORWAX; L.M. SCOFIELD COMPANY. Use to cure exterior flatwork that will be allowed to cure naturally with only occasional maintenance.
- C. SUBSTITUTIONS: The use of products other than those specified will be considered providing that the Contractor requests its use in writing within 14-days prior to bid date. This request shall be accompanied by the following:
 - 1. A certificate of compliance from material manufacturer stating that proposed products meet or exceed requirements of this Section, including standards ACI 303.1, ASTM C979, ASTM C494 and AASHTO M194.
 - 2. Documented proof that proposed materials have a 10-year proven record of performance, confirmed by at least 5 local projects that Landscape Architect can examine.

2.3 COLORS

- A. Concrete Color[s]:
 - 1. Cement: Color shall be gray.
 - 2. Sand: Color shall be locally available natural sand.
 - 3. Aggregate: Concrete producer's standard aggregate complying with specifications.

- 4. Colored Admixture: As selected by Landscape Architect from Scofield Color Chart A-312.
- B. Concrete Color[s]: Provide cement, sand, aggregate and colored admixture as required to match existing surrounding concrete walks.
- C. Curing Compound: Color to match integrally colored concrete.

2.4 CONCRETE MIX DESIGN

- A. Minimum Cement Content: 5 sacks per cubic yard of concrete.
- B. Slump of concrete shall be consistent throughout Project at 4-inches or less. At no time shall slump exceed 5-inches.
- C. Do not add calcium chloride to mix as it causes mottling and surface discoloration.
- D. Supplemental admixtures shall not be used unless approved by manufacturer.
- E. Do not add water to the mix in the field.
- F. Add colored admixture to concrete mix according to manufacturer's written instructions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install concrete according to requirements of Division 3 Section "Concrete Paving."
- B. Do not add water to concrete mix in the field.
- C. Surfaces shall be finished uniformly with the following finish:
 - 1. Broomed: Pull broom across freshly floated concrete to produce medium texture in straight lines perpendicular to main line of traffic. Do not dampen brooms.
 - 2. Sandblast: Allow concrete to cure to sufficient strength so that it will not be damaged by blasting but not less than seven days. Use heavy sandblasting to remove cement mortar from surface and expose aggregate to match originally approved mockup.

3.2 CURING

- A. Integrally Colored Concrete: Apply curing compound for integrally colored concrete according to manufacturer's instructions using manufacturer's recommended application techniques. Apply curing compound at consistent time for each pour to maintain close color consistency.
- B. Curing compound shall be same color as the colored concrete and supplied by same manufacturer of the colored admixture.
- C. Precautions shall be taken in hot weather to prevent plastic cracking resulting from excessively rapid drying at surface as described in CIP 5 *Plastic Shrinkage Cracking* published by the National Ready Mixed Concrete Association.

- D. Do not cover concrete with plastic sheeting.

3.3 TOLERANCES

- A. Minor variations in appearance of integrally colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable.

3.4 APPLICATORS

- A. For a list of qualified contractors, contact your local Scofield representative or the appropriate Division Office: Eastern Division – 201-672-9050; Western Division – 714-568-1870; Central Division Office – 630-377-5959.

END OF SECTION

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SECTION 044313 - STONE MASONRY VENEER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stone masonry anchored to concrete backup.
2. Stone masonry anchored to unit masonry backup.

B. Related Requirements:

1. Section 042000 "Unit Masonry"

1.2 ACTION SUBMITTALS

A. Product Data: For each variety of stone, stone accessory, and manufactured product.

B. Samples:

1. For each stone type indicated.
2. For each color of mortar required.

1.3 MOCK-UPS

- A.** Prior to construction, provide mock-up at least 5 lf x component ht. sufficient enough to represent the mix of stone and type of construction. The accepted mock-up can be included as part of the final product.

1.4 FIELD CONDITIONS

- A.** Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work.

- B.** Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried.

- C.** Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 LIMESTONE

- A. Material Standard: Comply with ASTM C 568.
- B. Regional Materials: Limestone shall be fabricated within 100 miles of Project site from stone that has been extracted within 100 miles of Project site.

2.2 MORTAR MATERIALS

- A. Regional Materials: Aggregate for mortar and grout shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Portland Cement: ASTM C 150, Type I or Type II, except Type III may be used for cold-weather construction; natural color or white cement may be used as required to produce mortar color indicated.
 - 1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Masonry Cement: ASTM C 91.
- E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in stone masonry mortar.
 - 1. Color: Buff
 - 2. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. **Davis Colors;** True Tone Mortar Colors.
 - b. **Lanxess Corporation;** Bayferrox Iron Oxide Pigments.
 - c. **Solomon Colors;** SGS Mortar Colors.
- F. Aggregate: ASTM C 144 and as follows:
 - 1. For pointing mortar, use aggregate graded with 100 percent passing No. 16 sieve.
 - 2. White Aggregates: Natural white sand or ground white stone.
 - 3. Colored Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
- G. Water: Potable-contractor shall provide all temporary hoses and connections.

2.3 VENEER ANCHORS

- A. Materials:

1. Hot-Dip Galvanized-Steel Wire: ASTM A 82, with ASTM A 153/A 153M, Class B-2.
 2. Hot-Dip Galvanized-Steel Sheet: ASTM A 1008/A 1008M, cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153/A 153M, Class B-2.
- B. Wire Veneer Anchors: Wire ties formed from W1.7 or 0.148-inch- diameter, hot-dip galvanized-steel wire.
- C. Corrugated-Metal Veneer Anchors: Not less than 0.030-inch- thick by 7/8-inch- wide hot-dip galvanized-steel sheet with corrugations having a wavelength of 0.3 to 0.5 inch and an amplitude of 0.06 to 0.10 inch.

2.4 MISCELLANEOUS MASONRY ACCESSORIES

- A. Cementitious Dampproofing for Limestone: Cementitious formulation recommended by ILI and nonstaining to stone, compatible with joint sealants, and noncorrosive to veneer anchors and attachments.
- B. Weep Products: Use the following unless otherwise indicated:
1. Mesh Weep Holes: Free-draining mesh; made from polyethylene strands, full width of head joint and 2 inches high by thickness of stone masonry; in color selected from manufacturer's standard.
 - a. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) **CavClear/Archovations, Inc.;** CavClear Weep Vents.
 - 2) **Mortar Net USA, Ltd.;** Mortar Net Weep Vents.

2.5 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.
1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. **Diedrich Technologies, Inc.**
 - b. **Dominion Restoration Products.**
 - c. **EaCo Chem, Inc.**
 - d. **Hydrochemical Techniques, Inc.**
 - e. **Prosoco, Inc.**

2.6 FABRICATION

- A. Cut stone to produce pieces of thickness, size, and shape indicated, including details on Drawings and pattern specified in "Setting Stone Masonry" Article.
- B. Gage backs of stones for adhered veneer if more than 81 sq. in. in area.
- C. Thickness of Stone: Provide thickness indicated, but not less than the following:
 - 1. Thickness: 4 inch plus or minus 1/4 inch.
- D. Finish exposed stone faces and edges to comply with requirements indicated for finish and to match approved samples.
 - 1. Finish: Split face.
 - a. Finish exposed ends of copings same as front and back faces.

2.7 MORTAR MIXES

- A. General: Do not use admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride.
 - 2. Use masonry cement or mortar cement mortar unless otherwise indicated.
 - 3. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for one to two hours. Add remaining water in small portions until mortar reaches required consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.
- B. Mortar for Stone Masonry: Comply with ASTM C 270, Proportion Specification.
 - 1. Mortar for Setting Stone: Type N.
 - 2. Mortar for Pointing Stone: Type N.

PART 3 - EXECUTION

3.1 SETTING STONE MASONRY

- A. Perform necessary field cutting and trimming as stone is set.
 - 1. Use power saws to cut stone that is fabricated with saw-cut surfaces.
 - 2. Use hammer and chisel to split stone that is fabricated with split surfaces.
 - 3. Pitch face at field-split edges as needed to match stones that are not field split.
- B. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.

- C. Arrange stones in broken-range ashlar pattern with uniform course heights, random lengths, and uniform joint widths.
- D. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance.
- E. Maintain uniform joint widths except for variations due to different stone sizes and where minor variations are required to maintain bond alignment if any. Lay walls with joints not less than 3/8 inch at narrowest points or more than 1 inch at widest points.
- F. Provide sealant joints of widths and at locations indicated.
 - 1. Keep sealant joints free of mortar and other rigid materials.
 - 2. Sealing joints is specified in Section 079200 "Joint Sealants."
- G. Coat limestone with cementitious dampproofing as follows:
 - 1. Stone at Grade: Beds, joints, and back surfaces to at least 12 inches above finish-grade elevations.
- H. Place weep holes in joints where moisture may accumulate, including above shelf angles and at flashing.
 - 1. Use open head joints to form weep holes.
 - 2. Use wicking material to form weep holes above flashing in stone sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
 - 3. Space weep holes 24 inches o.c.

3.2 INSTALLATION OF ANCHORED STONE MASONRY

- A. Anchor stone masonry to concrete with corrugated-metal veneer anchors unless otherwise indicated. Secure anchors by inserting dovetailed ends into dovetail slots in concrete.
- B. Anchor stone masonry to unit masonry with corrugated-metal veneer anchors unless otherwise indicated. Embed anchors in unit masonry mortar joints or grouted cells for distance at least one-half of unit masonry thickness.
- C. Anchor stone masonry to unit masonry with wire anchors unless otherwise indicated. Connect anchors to masonry joint reinforcement by inserting pintles into eyes of masonry joint reinforcement projecting from unit masonry.
- D. Anchor stone masonry to unit masonry with wire anchors unless otherwise indicated. Connect anchors to masonry joint reinforcement with vertical rods inserted through anchors and through eyes of masonry joint reinforcement projecting from unit masonry.
- E. Embed veneer anchors in mortar joints of stone masonry at least halfway, but not less than 1-1/2 inches, through stone masonry and with at least 5/8-inch cover on outside face.
 - 1. Install continuous wire reinforcement in horizontal joints and attach to seismic veneer anchors as stone is set.

- F. Space anchors to provide not less than 1 anchor per 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings, sealant joints, and perimeter at intervals not exceeding 12 inches.
- G. Space anchors not more than 16 inches o.c. vertically and 24 inches o.c. horizontally. Install additional anchors within 12 inches of openings, sealant joints, and perimeter at intervals not exceeding 12 inches.
- H. Set stone in full bed of mortar with full head joints unless otherwise indicated. Build anchors into mortar joints as stone is set.
- I. Fill collar joint with mortar as stone is set.
- J. Provide 1-inch cavity between stone masonry and backup construction unless otherwise indicated. Keep cavity free of mortar droppings and debris.
 - 1. Place mortar spots in cavity at veneer anchors to maintain spacing.
 - 2. Slope beds toward cavity to minimize mortar protrusions into cavity.
- K. Rake out joints for pointing with mortar to depth of not less than 1/2 inch. Rake joints to uniform depths with square bottoms and clean sides.

3.3 POINTING

- A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch deep until a uniform depth is formed.
- B. Point stone joints by placing and compacting pointing mortar in layers of not more than 3/8 inch deep. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
- C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
 - 1. Joint Profile: Smooth, flat face recessed 1/4 inch below edges of stone (raked joint).

3.4 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone masonry.

3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.
5. Clean stone masonry by bucket and brush hand-cleaning method described in BIA Technical Note No. 20, Revised II, using job-mixed detergent solution.
6. Clean stone masonry with proprietary acidic cleaner applied according to manufacturer's written instructions.
7. Clean limestone masonry to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.5 EXCESS MATERIALS AND WASTE

- A. Excess Stone: Stack excess stone where directed by Owner for Owner's use.
- B. Disposal as Fill Material: Dispose of clean masonry waste, including mortar and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.
 1. Do not dispose of masonry waste as fill within 18 inches of finished grade.

END OF SECTION 044313

SECTION 047200 - CAST STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast stone panels, caps, coping and spacers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include dimensions and finishes.

B. Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

C. Samples:

1. For each color and texture of cast stone required.
2. For colored mortar.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of cast stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute.

PART 2 - PRODUCTS

2.1 CAST STONE UNITS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Dallas Cast Stone Co.

- B. Regional Materials: Cast stone units shall be manufactured within 500 miles of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- C. Provide cast stone units complying with ASTM C 1364 using either the vibrant dry tamp or wet-cast method.
 - 1. Provide units that are resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.
 - 2. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
 - 3. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
 - 4. Provide drips on projecting elements unless otherwise indicated.
- D. Cure units as follows:
 - 1. Cure units in enclosed moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F for 12 hours or 70 deg F for 16 hours.
 - 2. Keep units damp and continue curing to comply with one of the following:
 - a. No fewer than five days at mean daily temperature of 70 deg F or above.
 - b. No fewer than six days at mean daily temperature of 60 deg F or above.
 - c. No fewer than seven days at mean daily temperature of 50 deg F or above.
 - d. No fewer than eight days at mean daily temperature of 45 deg F or above.
- E. Acid etch units after curing to remove cement film from surfaces to be exposed to view.
- F. Colors and Textures: As selected by Landscape Architect from manufacturer's full range.

2.2 ACCESSORIES

- A. Anchors: Type and size indicated, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666 and hot-dip galvanized to comply with ASTM A 123/A 123M.
- B. Dowels: 1/2-inch- diameter, round bars, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666 and hot-dip galvanized to comply with ASTM A 123/A 123M.
- C. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.
 - 1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. **Diedrich Technologies, Inc.**
 - b. **Dominion Restoration Products.**
 - c. **EaCo Chem, Inc.**

- d. Hydrochemical Techniques, Inc.
- e. Prosoco, Inc.

D. Sealer:

- 1. Type: Water based silane product.
- 2. Produce water repellent effect without altering color or texture of substrate.
- 3. Source: "Dynasylan BH-N" by Huls America, Inc. or approved substitute

2.3 MORTAR

A. Comply with requirements in Section 042000 "Unit Masonry" for mortar materials and mixes.

- 1. For setting mortar, use Type N.
- 2. For pointing mortar, use Type N.
- 3. Pigmented Mortar: Use colored cement product.

B. Regional Materials: Aggregate for mortar shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.4 SOURCE QUALITY CONTROL

A. Engage a qualified independent testing agency to sample and test cast stone units according to ASTM C 1364.

- 1. Include one test for resistance to freezing and thawing.

PART 3 - EXECUTION

3.1 SETTING CAST STONE IN MORTAR

A. Install cast stone units to comply with requirements in Section 042000 "Unit Masonry."

B. Set units in full bed of mortar with full head joints unless otherwise indicated.

- 1. Fill dowel holes and anchor slots with mortar.
- 2. Fill collar joints solid as units are set.
- 3. Build concealed flashing into mortar joints as units are set.
- 4. Keep head joints in coping and other units with exposed horizontal surfaces open to receive sealant.
- 5. Keep joints at shelf angles open to receive sealant.

C. Rake out joints for pointing with mortar to depths of not less than 3/4 inch. Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

- D. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
- E. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- F. Provide sealant joints at copings and other horizontal surfaces, at expansion, control, and pressure-relieving joints, and at locations indicated.
 - 1. Keep joints free of mortar and other rigid materials.
 - 2. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.2 SETTING ANCHORED CAST STONE WITH SEALANT-FILLED JOINTS

- A. Set units accurately in locations indicated with edges and faces aligned.
 - 1. Install anchors, supports, fasteners, and other attachments to secure units in place.
 - 2. Shim and adjust anchors, supports, and accessories.
- B. Fill anchor holes with sealant.
 - 1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.
- C. Set cast stone supported on clip or continuous angles on resilient setting shims. Hold shims back from face of cast stone a distance at least equal to width of joint.
- D. Keep joints free of mortar and other rigid materials. Remove temporary shims and spacers from joints after anchors and supports are secured in place and cast stone units are anchored.
- E. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
- B. Variation from Level: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
- C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.
- D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except where variation is due to warp of units within tolerances specified.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.
- B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean cast stone as work progresses.
 - 1. Remove mortar fins and smears before tooling joints.
 - 2. Remove excess sealant immediately, including spills, smears, and spatter.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone to comply with requirements in Section 042000 "Unit Masonry."

END OF SECTION 047200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Urethane joint sealants.
 - 2. Joint Backing

1.2 RELATED SECTIONS

- A. Section 033000 - Cast-in-Place Concrete
- B. Section 044313 - Masonry

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: Submit two samples, 1x1 inch in size illustrating sealant colors for selection.
- C. Samples: For each kind and color of joint sealant required.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Warranties.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 1 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.2 URETHANE JOINT SEALANTS

- A. Applications for use:

1. Control, expansion, and soft joints in masonry.

- B. Urethane Joint Sealant: ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. **Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. **BASF Building Systems.**
 - b. **Bostik, Inc.**
 - c. **Lyntal, International, Inc.**
 - d. **May National Associates, Inc.**
 - e. **Pacific Polymers International, Inc.**
 - f. **Pecora Corporation.**
 - g. **Polymeric Systems, Inc.**
 - h. **Schnee-Morehead, Inc.**
 - i. **Sika Corporation; Construction Products Division.**
 - j. **Tremco Incorporated.**
3. Type: Single component (S).
4. Grade: nonsag (NS).
5. Class: 25.
6. Uses Related to Exposure: Nontraffic (NT).
7. Color: Limestone

2.3 URETHANE JOINT SEALANTS

- A. Applications for use:
 - 1. Joints in sidewalks and vehicular paving
- B. Urethane Joint Sealant: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. **Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. **BASF Building Systems.**
 - b. **Bostik, Inc.**
 - c. **Lyntal, International, Inc.**
 - d. **May National Associates, Inc.**
 - e. **Pacific Polymers International, Inc.**
 - f. **Pecora Corporation.**
 - g. **Polymeric Systems, Inc.**
 - h. **Schnee-Morehead, Inc.**
 - i. **Sika Corporation; Construction Products Division.**
 - j. **Tremco Incorporated.**
 - 3. Type: Single component (S).
 - 4. Grade: Pourable (P).
 - 5. Class: 25.
 - 6. Uses Related to Exposure: Traffic (T).
 - 7. Color: Limestone

2.4 JOINT SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Joints between plant-precast architectural concrete paving units.
 - c. Joints between different materials listed above.
 - d. Other joints as indicated.
 2. Joint Sealant: Urethane.
 3. Joint-Sealant Color: Limestone.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints in dimension stone cladding.
 - d. Joints between different materials listed above.
 - e. Other joints as indicated.
 2. Joint Sealant: Urethane.
 3. Joint-Sealant Color: Limestone

END OF SECTION 079200

SECTION 260501

ELECTRICAL

PART 1 - GENERAL

1.1 BASIC REQUIREMENTS

- A. General: Furnish and install all labor material, equipment, tools and services necessary to provide the complete and fully operational electrical systems diagrammatically represented on the plans and described in these specifications.
- B. Provide the electrical service, power distribution, lighting and controls as shown on the drawings.
- C. Code Compliance: Comply with all local, State, and National codes relating to public safety including the National Electrical Code, North Central Texas Council of Governments, City Ordinances and Standards and the utility company standards.
- D. Permits: Secure and pay for all necessary permits, licenses and inspections required by law.
- E. Site Investigation: Examine the site to determine conditions that will affect the work and include all work related to site conditions in the bid proposal.
- F. Materials: All materials shall be new and shall bear the Underwriters Laboratories label where UL has a label for that particular type of equipment.
- G. Workmanship: Perform the work with competent mechanics, skilled in their trades, timely placing all materials as the construction progresses.
- H. Submittals: Submit manufacturer's product data on all material proposed for the project.
- I. Trenching: Provide all excavation and backfill necessary for the installation of specified work. Conduit cover shall be minimum 18" and 24" under parking, drives and roadways in accordance with NEC Table 300-5. Service conductors that are not encased in concrete and that are buried eighteen inches or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least twelve inches above the underground installation in accordance with NEC 300.5 D 3. All underground circuits shall have warning ribbon with trace wire.
- J. Coordination: The electrical construction shall be coordinated with the work of other trades. Study the complete contract documents to determine the full scope of work and to identify work performed by other trades.
- K. Substitution: Materials and products of manufacturers other than those specified require approval in writing. Submit shop drawings and product data for approval.
- L. Handling: Handle electrical equipment, devices, and materials with care to prevent damage to finishes. Damaged equipment shall be replaced. Touch up paint shall be applied to scratches where approved by the Engineer/Architect.

- M. Guarantee: The Contractor shall guarantee the construction to be free from defect of material and workmanship for a period of one year from the date of final acceptance. Replace or repair all defective material and workmanship without cost to the Owner.

PART 2 - PRODUCTS

2.1 GROUNDING

- A. Ground the service entrance in accordance with NEC. Grounding electrodes shall be 5/8-inch diameter, 8 feet long steel rod with copper exterior. Bond the grounding electrode conductor to the ground rod with Cadweld thermal fusion connector.
- B. Provide a grounding conductor in each feeder and branch circuit.
- C. Ground each pole mounted lighting fixture according to base detail.
- D. Ground bridge mounted fixtures to the bridge steel reinforcement.

2.2 RACEWAYS

- A. Underground conduit shall be rigid nonmetallic PVC, Schedule 40 with PVC couplings of the solvent cement type to provide complete watertight joints. **Conduit used for bores shall be PVC, Schedule 80.** Conduit and couplings shall be UL listed and labeled for direct burial. Provide galvanized rigid steel 90-degree elbows and watertight connections between nonmetallic conduit and steel conduit.
- B. Exposed conduit shall be rigid steel galvanized inside and out. Couplings shall be threaded rigid steel galvanized. Coat all exposed threads with zinc chromate.
- C. Underground rigid steel conduit shall be plastic coated.
- D. Before conductors are pulled into a conduit, thoroughly swab the conduit to remove foreign material and to permit the wire to be pulled into a clean, dry raceway.
- E. Provide cast junction boxes, pull boxes or condulets as required to complete the raceway system.
- F. **Pull boxes (ground boxes) shall meet TxDOT standards and comply with standard TxDOT details.**

2.3 CONDUCTORS

- A. Provide conductors of stranded soft-drawn annealed copper, 98% conductivity new building wire, insulated in accordance with NEC. Conductors shall be rated 600-volts, THWN and 60 degrees C. UL listed bolted pressure or spring connectors shall be properly sized for conductor sizes. All underground connections shall be made weather tight.

2.4 METER PEDESTAL

- A. The pedestal shall be of NEMA Type 3R rainproof construction and shall be UL Listed as "Enclosed Industrial Control Equipment" (UL 508A). External construction shall comply with UL50 requirements and shall be of G90 galvanized steel with light green #14672 Federal Specification 595 polyurethane industrial grade powder paint of 1.7 mil minimum thickness. Internal construction shall be G90 galvanized steel and 1.7 mil minimum thickness polyurethane industrial grade powder coat painted or bare aluminum. No fasteners except sealing screws shall be removable by external access. Hinges shall be stainless steel and of the continuous piano hinge type.
- B. The pedestal mounting bolts shall not be externally accessible. The pedestal shall be offered with an optional base designed to be embedded in concrete in place of anchor bolts. Either pedestal mounting base or anchor bolt kit is required for installation.
- C. The service pedestal must have three separate isolated sections for metering equipment, utility termination and customer equipment.
- D. The metering section must be pad-lockable and sealable and have a hinged swing back hood with an integral hinged polycarbonate sealable window for access to demand meters. An external nameplate shall be permanently attached to the hood. A stainless steel handle shall be provided on the front exterior of the hood. Meter socket type shall meet the requirements of the serving utility.
- E. The utility termination section must be pad-lockable and sealable and shall have a stainless steel handle provided on a lift-off cover. Sufficient clearance shall be provided for a 4-inch diameter conduit for utility cables entrance. Utility landing lugs shall be UL listed and shall accommodate #6 – 350 kcmil conductors.
- F. The customer compartment door to be hinged on the left hand side. A stainless pad-lockable hasp provided to secure customer compartment. A door keeper provided to keep the door in an open position. A print pocket on the inside of the door shall hold all wiring schematics, circuit directories and instructions in a clear, weatherproof sleeve. Required UL labeling shall be located on the inside of the customer door. Distribution and control equipment shall be behind an internal dead-front door with a quarter-turn securing latch and be hinged to open more than 90 degrees. The dead-front door shall be hinged on the same side as the customer section door. All distribution and control equipment shall be factory wired using 600 volt wire sized to NEC and UL requirements.
- G. The service pedestal shall include an electrical panel rated for operation at 10K minimum (AIC) amps interrupting capacity. The provided documentation shall list circuit breaker combinations and those to be used for de-rated operation for series ratings. Circuit breakers shall be permanently labeled with engraved name plates.
- H. Panel shall be load center construction, dead-front safety type with NEMA 250, NEMA Type enclosure as required for the installation, UL listed for service equipment, main breaker, tin-plated copper bus, mechanical type main and neutral lugs, equipment ground bus, and molded case circuit breakers.
- I. Circuit breakers shall be molded case, thermal magnetic type equipped with individually insulated, braced and protected connectors.
- J. Panel and breakers shall have the minimum interrupting capacity that is standard for the equipment voltage.

- K. Panel and breakers shall be manufactured by one of the following: Square D, GE, Siemens, or Cutler-Hammer.
- L. Utility requirements for this equipment varies. Consult the serving utility for their requirements before ordering or installing this equipment.

2.5 CIRCUIT BREAKER

- A. Circuit breakers shall be molded case, thermal magnetic type equipped with individually insulated, braced and protected connectors.
- B. Breakers shall have the minimum interrupting capacity that is the same as panel.
- C. Breakers shall be manufactured by the same manufacturer of the panel.

2.6 LIGHTING

- A. Lighting fixtures shall be as defined on drawings complete with high-power-factor driver rated for 22 degrees F starting temperature and epoxy-encapsulated.
- B. LED white color temperature shall be rated for 40,000 hours.
- C. Mount fixture level, plumb, and square with finish grade and secure according to the manufacturer's written instructions.
- D. Provide accessories, supports and concrete pads for mounting fixtures.
- E. Coordinate fixture mounting on bridge with structural construction.
- F. Mount adjust and direct fixture as shown on drawings.
- G. Fixtures shall be installed complete with the specified lamps.
- H. Coordinate monument lighting requirements with shop drawings and equipment supplier.

2.7 BOXES, ENCLOSURES, AND CABINETS

- A. Subject to compliance with requirements, provide products described on plans.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- D. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep at LED monument lights mounted behind lighting fixture.
- E. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2.8 LIGHTING CONTROL DEVICES

- A. Photoelectric Relay: Shall be solid-state single-pole, double-throw dry contacts rated to operate the branch circuit voltage. Light-level monitor range shall be 0 to 3500 fc with an adjustment for turn-on and turn-off levels. Time delay shall prevent false operation. Weatherproof enclosure UL labeled for exterior use in wet locations. Tork model #2107 or approved equal.
- B. Time Switches:
 - 1. Subject to compliance with requirements, provide **product indicated on Drawings** or comparable product
 - 2. Electromechanical-Dial Time Switches: Comply with UL 917.
 - a. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - a. Contact Configuration: SPST.
 - b. Contact Rating: 30-A inductive or resistive, 240-V ac
 - a. Circuitry: Allows connection of a photoelectric relay as a substitute for the on-off function of a program.
 - a. Astronomic time dial.
 - b. Eight-Day Program: Uniquely programmable for each weekday and holidays.
 - c. Skip-a-day mode.
 - d. Wound-spring reserve carryover mechanism to keep time during power failures, minimum of 16 hours.

2.9 RACEWAY AND CONDUCTOR IDENTIFICATION

- A. Marker Tapes: Vinyl or vinyl-cloth, self adhesive wraparound type, with circuit identification legend machined printed and laminated with clear, weather and chemical-resistant coating.

PART 3 - EXECUTION

3.1 TESTING

- A. All equipment and systems shall be tested and demonstrated to operate in accordance with the specifications and drawings.
- B. Test all wiring and devices as sections of construction are completed and replace any defective equipment, materials or installation.
- C. Provide all equipment and properly calibrated instruments necessary to test the electrical system for shorts and grounds. Megger all wiring for shorts between conductors and for grounded and open circuits. Faulty wiring shall be removed and replaced.

END OF SECTION 260501

SECTION 310000 - TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.
- E. Storm Water Pollution Prevention Plan (SW3P).

1.02 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

2.02 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

2.03 SCOPE OF PREVENTIVE MEASURES

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Construction Entrances: Traffic-bearing aggregate surface.
- C. Linear Sediment Barriers: Made of silt fences.
 - 1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
 - c. Along the toe of cut slopes and fill slopes.
 - d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at maximum of 200 feet apart.
 - e. Across the entrances to culverts that receive runoff from disturbed areas.
 - 2. Space sediment barriers with the following maximum slope length upslope from barrier:
 - a. Slope of Less Than 2 Percent: 100 feet..
 - b. Slope Between 2 and 5 Percent: 75 feet.
 - c. Slope Between 5 and 10 Percent: 50 feet.
 - d. Slope Between 10 and 20 Percent: 25 feet.
 - e. Slope Over 20 Percent: 15 feet.

- D. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide over storm water outlets.
- E.. Soil Stockpiles: Protect using one of the following measures:
 1. Cover with polyethylene film, secured by placing soil on outer edges.
 2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- F. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.

2.04 INSTALLATION

- A. Where vehicular access is required temporarily during course of construction, traffic-Bearing Aggregate Surface:
 1. Excavate minimum of 6 inches.
 2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 3. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.
 4. Once construction is complete, all aggregate and geotextile is to be removed, area to be graded and filled per section 02316 and made good.
- B. Silt Fences:
 1. Store and handle fabric in accordance with ASTM D 4873.
 2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
 4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 5. Install with top of fabric at nominal height and embedment as specified.
 6. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
 7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 8. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
 9. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.
- C. Straw Bale Rows:
 1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
 2. Install bales so that bindings are not in contact with the ground.
 3. Embed bales at least 4 inches in the ground.
 4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
 5. Fill gaps between ends of bales with loose straw wedged tightly.
 6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
- D. Mulching Over Large Areas:
 1. Dry Straw and Hay: Apply 2-1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of

- mulch.
- 2. Wood Waste: Apply 6 to 9 tons per acre.
- E. Mulching Over Small and Medium Areas:
 - 1. Dry Straw and Hay: Apply 4 to 6 inches depth.
 - 2. Wood Waste: Apply 2 to 3 inches depth.

2.05 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
 - 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 - 2. Remove silt deposits that exceed one-third of the height of the fence.
 - 3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- D. Straw Bale Rows:
 - 1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
 - 2. Remove silt deposits that exceed one-half of the height of the bales.
 - 3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- E. Clean out temporary sediment control structures weekly and relocate soil on site.
- F. Place sediment in appropriate locations on site; do not remove from site.

2.06 CLEAN UP

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Design Consultant.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Review the erosion and sediment control plan provided and modify as required for the Contractor's construction sequence. Modifications shall maintain conformance with the Contractor's storm water pollution prevention plan and the requirements of TPDES. Work and materials required for installation, modification and maintenance of the Erosion Control System shall be incidental to the contract.
- B. Locate and protect survey horizontal and vertical control.

3.2 STORM WATER POLLUTION PREVENTION PLAN (SW3P)

- A. The Contractor is responsible for preparation of the required documents, submittals to the TCEQ including Notice of Intent (NOI) and Notice of Termination (NOT) with a separate Notice of Intent (NOI) for the Owner, weekly and event inspections, documentation and record keeping, maintenance and repair of the erosion control devices and removal of temporary facilities when permanent facilities are in place and construction is complete.

END OF SECTION

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Stripping and stockpiling topsoil.
4. Removing above- and below-grade site improvements.
5. Disconnecting, capping or sealing site utilities.

1.2 MATERIAL OWNERSHIP

- A.** Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 RELATED SECTIONS

- A.** 310000 – Temporary Erosion and Sedimentation Control

1.4 PROJECT CONDITIONS

- A.** Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B.** Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C.** Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- D.** Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.
- E.** The following practices are prohibited within protection zones:
1. Storage of construction materials, debris, or excavated material.

2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
 1. Restore damaged improvements to their original condition, as acceptable to Owner, at no additional cost to the Owner.

3.2 EXISTING UTILITIES

- A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 1. Arrange with utility companies to shut off indicated utilities.
- B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Architect's written permission.

3.3 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

3.4 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

3.5 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparing subgrades for slabs-on-grade walks pavements turf and grasses and plants.
2. Excavating and backfilling for structures.
3. Drainage course for concrete slabs-on-grade.
4. Subbase course for concrete walks pavements.
5. Subbase course and base course for asphalt paving.
6. Excavating and backfilling for utility trenches.

1.2 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.3 PROJECT CONDITIONS

- A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course.

3.6 SUBGRADE INSPECTION

- A. Proof-roll subgrade below pavements. Insert locations with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in "Cast-in-Place Concrete"
- D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
 - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
 - 3. Under steps and ramps, use engineered fill.
 - 4. Under footings and foundations, use engineered fill.

3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
 - 3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 - 4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Turf or Unpaved Areas: Plus or minus 1 inch.
 - 2. Walks: Plus or minus 1 inch.
 - 3. Pavements: Plus or minus 1/2 inch.

3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course under pavements and walks as follows:
 - 1. Shape subbase course to required crown elevations and cross-slope grades.
 - 2. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 - 3. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.15 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
 - 1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 - 2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.16 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321400 - UNIT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concrete pavers set in aggregate setting beds.
 - 2. Steel edge restraints.

1.2 ACTION SUBMITTALS

- A. Product Data: For materials other than water and aggregates.
- B. Samples for unit pavers and edge restraints.

1.3 PROJECT CONDITIONS

- A. Cold-Weather Protection: Do not use frozen materials or build on frozen subgrade or setting beds.

PART 2 - PRODUCTS

2.1 CONCRETE PAVERS

- A. Regional Materials: Provide concrete pavers that have been manufactured within 500 miles of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Concrete Pavers: Solid interlocking paving units complying with ASTM C 936 and resistant to freezing and thawing when tested according to ASTM C 67, made from normal-weight aggregates.
 - 1. Thickness: 2-3/8 inches.
 - 2. Face Size and Shape: 3-7/8-by-7-7/8-inch rectangle.
 - 3. Color: Oaks Blend and Tan-See plans for locations.

2.2 EDGE RESTRAINTS

- A. Steel Edge Restraints: Manufacturer's standard painted steel edging 3/16 inch thick by 4 inches high with loops pressed from or welded to face to receive stakes at 36 inches o.c., and steel stakes 15 inches long for each loop.

1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. **Border Concepts, Inc.**
 - b. **Collier Metal Specialties, Inc.**
 - c. **J. D. Russell Company (The).**
 - d. **Sure-loc Edging Corporation.**
2. **Color:** As selected by Owner from manufacturer's full range.

2.3 ACCESSORIES

- A. **Cork Joint Filler:** Preformed strips complying with ASTM D 1752, Type II.

2.4 AGGREGATE SETTING-BED MATERIALS

- A. **Graded Aggregate for Base:** Sound, crushed stone or gravel complying with ASTM D 448 for Size No. 8.
- B. **Sand for Leveling Course:** Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C 33 for fine aggregate.
- C. **Sand for Joints:** Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 sieve and no more than 10 percent passing No. 200 sieve.
- D. **Drainage Geotextile:** Nonwoven needle-punched geotextile fabric, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 1. **Apparent Opening Size:** No. 40 sieve, maximum; ASTM D 4751.
 2. **Permittivity:** 0.5 per second, minimum; ASTM D 4491.
- E. **Herbicide:** Commercial chemical for weed control, registered with the EPA. Provide in granular, liquid, or wettable powder form.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. **Mix pavers** from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.
- B. **Cut unit pavers** with motor-driven masonry saw equipment to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible.
 1. For concrete pavers, a block splitter may be used.

- C. Joint Pattern: Running bond As indicated.
- D. Pavers over Waterproofing: Exercise care in placing pavers and setting materials over waterproofing so protection materials are not displaced and waterproofing is not punctured or otherwise damaged.
 - 1. Provide joint filler at waterproofing that is turned up on vertical surfaces.
- E. Tolerances: Do not exceed 1/16-inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches and 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.
- F. Expansion and Control Joints: Provide for sealant-filled joints at locations and of widths indicated. Provide compressible foam filler as backing for sealant-filled joints. Install joint filler before setting pavers. Sealant materials and installation are specified in Section 079200 "Joint Sealants."
- G. Expansion and Control Joints: Provide cork joint filler at locations and of widths indicated. Install joint filler before setting pavers. Make top of joint filler flush with top of pavers.
- H. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.

3.2 AGGREGATE SETTING-BED APPLICATIONS

- A. Compact soil subgrade uniformly to at least 95 percent of ASTM D 698 laboratory density.
- B. Place aggregate base, compact by tamping with plate vibrator, and screed to depth indicated.
- C. Place drainage geotextile over compacted base course, overlapping ends and edges at least 12 inches.
- D. Place leveling course and screed to a thickness of 1 to 1-1/2 inches, taking care that moisture content remains constant and density is loose and uniform until pavers are set and compacted.
- E. Treat leveling course with herbicide to inhibit growth of grass and weeds.
- F. Set pavers with a minimum joint width of 1/16 inch and a maximum of 1/8 inch, being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines. Fill gaps between units that exceed 3/8 inch with pieces cut to fit from full-size unit pavers.
- G. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz.
- H. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.

END OF SECTION 321400

SECTION 329113 - SOIL PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes planting soils specified by composition of the mixes.
- B. Related Requirements:
 - 1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.

1.2 DEFINITIONS

- A. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
- B. Imported Soil: Soil that is transported to Project site for use.
- C. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- E. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- F. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- G. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- H. USCC: U.S. Composting Council.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each bulk-supplied material in sealed containers labeled with content, source, and date obtained; providing an accurate representation of composition, color, and texture.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Regional Materials: Imported soil manufactured planting soil and soil amendments and fertilizers shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.2 PLANTING SOILS SPECIFIED BY COMPOSITION

- A.
 - 1. Unacceptable Properties: Clean soil of the following:
 - a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
 - b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 8 percent by dry weight of the imported soil.
 - c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 2 inches in any dimension.
- B. Planting-Soil Type: Manufactured soil consisting of manufacturer's basic topsoil, blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials to produce viable planting soil.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 2. Additional Properties of Manufacturer's Basic Soil before Amending: Soil reaction of pH 6 to 7 and minimum of 2 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
 - 3. Unacceptable Properties: Manufactured soil shall not contain the following:
 - a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar,

roofing compound, acid, and other extraneous materials that are harmful to plant growth.

- b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 5 percent by dry weight of the manufactured soil.
- c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 2 inches in any dimension.

2.3 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 - 1. Class: T, with a minimum of 99 percent passing through a No. 8 sieve and a minimum of 75 percent passing through a No. 60 sieve.
 - 2. Class: O, with a minimum of 95 percent passing through a No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.
- B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Perlite: Horticultural perlite, soil amendment grade.
- E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.
- F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.4 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
 - 1. Feedstock: Limited to leaves.
 - 2. Reaction: pH of 5.5 to 8.
 - 3. Soluble-Salt Concentration: Less than 4 dS/m.
 - 4. Moisture Content: 35 to 55 percent by weight.
 - 5. Organic-Matter Content: 30 to 40 percent of dry weight.
 - 6. Particle Size: Minimum of 98 percent passing through a 2-inch sieve.
- B. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

- C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.5 FERTILIZERS

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.
- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

PART 3 - EXECUTION

3.1 GENERAL

- A. Place planting soil and fertilizers according to requirements in other Specification Sections.
- B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

3.2 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

- A. Excavation: Excavate soil from designated area(s) to a depth of 6 inches and stockpile until amended.
- B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
- C. Unsuitable Materials: Clean soil to contain a maximum of 8 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.
- D. Screening: Pass unamended soil through a 3-inch sieve to remove large materials.

3.3 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

- A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Subgrade Preparation: Till subgrade to a minimum depth of 4 inches. Remove stones larger than 3 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Mixing: Spread unamended soil to total depth of 4 inches, but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
 - 1. Amendments: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them with unamended soil to produce planting soil.
 - a. Mix fertilizer with planting soil no more than seven days before planting.
- D. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698 and tested in-place.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 PLACING MANUFACTURED PLANTING SOIL OVER EXPOSED SUBGRADE

- A. General: Apply manufactured soil on-site in its final, blended condition. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Subgrade Preparation: Till subgrade to a minimum depth of 4 inches. Remove stones larger than 3 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Application: Spread planting soil to total depth of 4 inches, but not less than required to meet finish grades after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
- D. Compaction: Compact each lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.5 BLENDING PLANTING SOIL IN PLACE

- A. General: Mix amendments with in-place, unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

- B. Preparation: Till unamended, existing soil in planting areas to a minimum depth of 4 inches. Remove stones larger than 3 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Mixing: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.
 - 1. Mix fertilizer with planting soil no more than seven days before planting.
- D. Compaction: Compact blended planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.6 FIELD QUALITY CONTROL

- A. Perform the following tests:
 - 1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D 698. Space tests at no less than one for each 1000 sq. ft. of in-place soil or part thereof.
- B. Soil will be considered defective if it does not pass tests.
- C. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

3.7 PROTECTION AND CLEANING

- A. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Vehicle traffic.
 - 4. Foot traffic.
 - 5. Erection of sheds or structures.
 - 6. Impoundment of water.
 - 7. Excavation or other digging unless otherwise indicated.
- B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.
 - 1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION 329113

SECTION 329200
TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide all material and labor to install and maintain for the guarantee period all turf areas
 - 1. Hydraulic Seeding.

1.2 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. Seeded Areas-By the square yard. Includes placing topsoil, fine grading, seeding, water and maintenance to specified time limit.

1.3 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

- I. Surface Soil: Whatever soil is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

- A. Test Reports: Results of seed purity and germination tests.
- B. Certificates: Manufacturer's certification that seed and mulch meet specification requirements.
- C. File all results and certificates with the Owner prior to the final acceptance.
- D. Maintenance Instructions: Submit to the Owner prior to the final acceptance.
- E. Test Reports: Submit certification of fertilizer analysis

1.5 QUALITY ASSURANCE

- A. Source Quality Control: Producer's test for purity and germination of seed dated within nine months of sowing and submit to Owner.
- B. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 1. Pesticide Applicator: State licensed, commercial.
- C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory.
 - 1. The soil-testing laboratory shall oversee soil sampling.
 - 2. Report suitability of tested soil for turf growth.
 - a. State recommendations for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
 - b. Report presence of problem salts, minerals, or heavy metals; if present, provide additional recommendations for corrective action.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

1.7 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
 - 1. Seeded Turf: Maintain until entire project is accepted by the Owner.
 - a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

1.8 RESTORATION

- A. The Contractor shall be responsible for repairing any damage done to any existing site improvements caused by the Contractor, at no additional expense to the Owner.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

2.2 HYDROLIC SEEDING

- A. Seed Species: State-certified seed of grass species as follows:
 - a. Seed (Feb 15 until June 1)
 - b. Species: 100% Buffalograss (*Bouteloua dactyloides*) of 95% purity. treated with KNO 3 (potassium nitrate)
 - c. Percent of Live Seed: 85%
 - d. Clean, dry, new crop seed.
- B. Seed Species: State-certified seed of grass species as follows:
 - a. Temporary Turf - Seed (September 15 until Feb 15)
 - b. Species: -100% Gulf Rye Grass (*Lolium multiflorum*) of 85% purity
 - c. Percent of Live Seed: 85%
- C. Mulch with Tackifier

1. Maximum Moisture Content..... 10% + 3%
2. Virgin Wood Fiber Content..... 65% + 0.5% O.D. Basis
3. Paper..... 25% + 0.5% O.D. Basis
4. Tackifier Content..... 3% + 0.5% O.D. Basis
5. Ash Content..... 0.8% + 0.2% O.D. Basis
6. PH..... 4.8 + 0.5
7. Minimum Water Holding Capacity (grams of water per 100 grams of fiber)..... 1,000
8. Wood fiber shall be dyed green with a biodegradable dye that does not inhibit plant growth.
9. Wood fiber SHALL NOT be produced from recycled material such as sawdust, paper, cardboard, or residue from pulp and paper plants.
10. Wood fiber mulch shall be packaged in units not exceed 100 lbs. The package shall contain current labels, the manufacturer's name and the net weight.

2.3 FERTILIZERS

1. Uniform composition.
2. Pelletized.
3. Containing following minimum percentage of plant food by weight:
 - a. Nitrogen: 15%
 - b. Phosphoric Acid: 4%
 - c. Potash: 8%
4. The fertilizer shall be delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable state fertilizer laws, and bearing the name, trade name or trademark, and warranty of the producer.

2.4 PLANTING SOILS

- A. Planting Soil: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 2 percent organic material content or Imported topsoil or manufactured topsoil from off-site sources; do not obtain from agricultural land, bogs or marshes. Verify suitability of soil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

2.5 MULCHES

- A. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

2.6 PESTICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

2.7 WATER

- A. Water: Potable, available on-site. Contractor shall furnish temporary hoses and all connections as required.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall check that preceding work affecting ground surface is completed.
- B. Contractor shall verify that soil is within allowable range of moisture content.
- C. Contractor shall see that the soil is free of weeds and foreign material immediately before seeding. Remove rocks and stones which are larger than 2 inches in diameter and remove from the site.
- D. Contractor shall not start work until conditions are satisfactory. To begin work indicates acceptance of conditions.

3.2 TURF AREA PREPARATION

- A. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply superphosphate fertilizer directly to subgrade before loosening.
 - 2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
 - 3. Spread planting soil to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

- a. Reduce elevation of planting soil to allow for soil thickness of sod.
- B. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
 - a. Apply superphosphate fertilizer directly to surface soil before loosening.
 - 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
 - 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- D. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.3 APPLICATION

- A. Apply hydromulch material with an approved spray applicator equipment suitable for the seed, mulch and stabilizer specified.
- B. Apply materials at the following rates or as approved by the Owner.
 - 1. Mulch with Tackifier 1,600 pounds per acre (36.75 lbs/1000 sf).
 - 2. Fertilizer: 523 pounds per acre (12.0 lbs/1000 sf).
- C. If planting occurs between Feb 15 and June 1, provide Buffalograss (*Buchloe dactyloides*), 150 pounds per acre (3 lbs/1000 sf).
- D. If planting occurs between September 15 and May 15, provide Gulf annual ryegrass, 200 pounds per acre (4.5 lbs/1000sf). Return to Project site between Feb 15 and June 1 after all the ryegrass has died, till the hydromulch area, remove weeds, rocks, debris, and other objectionable material, and re-apply the buffalo grass as described above.
- E. Water all hydromulched areas to a minimum depth of 4 inches.

3.4 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
- B. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain height appropriate for species without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings.
- C. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

3.5 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

END OF SECTION 329200

SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plants.
 - 2. Soil amendments
 - 3. Maintenance
 - 4. Landscape edging.
- B. Related Requirements:
 - 1. Section 328000 Landscape Irrigation System

1.2 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.
- C. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- D. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples of each type of mulch.
- C. Maintenance Instructions: Submit written maintenance schedule for maintaining plant material after completion of job to Owner before final inspection.
- D. Nursery Qualifications
- E. Installer Qualifications

F. Pest Control Applicator Qualifications

1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

1.6 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 1. Pesticide Applicator: State licensed, commercial.
- B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1. Plants shall be subject to inspection and approval by Owner at place of growth or upon delivery to site for conformity to specified requirements.
- C. Comply with American Joint Committee of Horticultural Nomenclature "Standardized Plant Names", American Association of Nurserymen, Inc. American Standard for Nursery Stock.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver bare-root stock plants within 36 hours of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.
- B. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- C. Handle planting stock by root ball.
- D. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.
- E. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate

aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

- F. Inspect trees, shrubs, and ground cover plants for injury, insect infestation, and trees and shrubs for improper size and shape

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install plant life when ambient temperatures may drop below 35 degrees F (2 degrees C) or rise above 95 degrees F (32 degrees C).
- B. Do not install plant life when wind velocity exceeds 30 mph (48 k/hr).

1.9 SCHEDULING

- A. Install trees, shrubs, and ground cover plants prior to lawn installation.
- B. Coordinate scheduling with underground irrigation system installation.

1.10 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
 - b. Structural failures including plantings falling or blowing over.
 - 2. Warranty Periods: From date of Final Acceptance.
 - a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
 - b. Ground Covers, Biennials, Perennials, and Other Plants: Six months.
 - c. Annuals: Three months.
- B. Warranty will not apply to damage or injury to plant materials caused by vandalism, vehicles, and storms.
- C. Replace plants within 15 days of written notification by Owner.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- C. Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.
- D. Plant material shall be true to botanical and common name and variety.

2.2 FERTILIZERS

- A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
 - 1. Size: 10-gram tablets.
 - 2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 WEED-CONTROL BARRIERS

- A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

2.4 PESTICIDES

- A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

2.5 LANDSCAPE EDGINGS

- A. Steel Edging: Standard commercial-steel edging, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. **Basis-of-Design Product:** Subject to compliance with requirements, provide or comparable product by one of the following:
 - a. **Border Concepts, Inc.**
 - b. **Collier Metal Specialties, Inc.**
 - c. **Russell, J. D. Company (The).**
 - d. **Sure-loc Edging Corporation.**
 - 3. Edging Size: 1/4 inch thick by 4 inches deep.
 - 4. Finish: Manufacturer's standard paint.

2.6 SOIL AND AMENDMENT MATERIALS

- A. Imported Topsoil for Prepared Soil Mixtures
 - 1. Sandy loam from source approved by Owner; 100 percent passing through 1-inch screen.
 - a. Sand (2,000 mm to 0.50 mm): 40 to 50 percent.
 - Silt (0.050 mm to 0.005 mm): 30 to 40 percent.
 - Clay (0.005 mm and smaller): 10 to 30 percent.
 - 2. Free of subsoil, brush, stumps, roots, organic litter, objectionable weeds, clods, shale, stones 1-inch minimum dimension or larger, or other material harmful to grading, planting, plant growth, or maintenance operations.
 - 3. Presence of vegetative parts of Bermuda grass, Johnson grass, nut grass (*Cyperus rotundus*), and other hard to eradicate weeds or grass will be cause for rejection of topsoil.
- B. Organic Soil Conditioner: Soil Building Systems, "Acid Gro Premix"; (214) 239-4777, or approved equal.
- C. Root Activator: Carl Pool Root Activator, (972) 347-3330; or approved equal.

2.7 WATERING

PART 3 - EXECUTION

3.1 PLANTING AREA ESTABLISHMENT

- A. General: Prepare planting area for soil placement and mix planting soil according to "Soil Preparation."

- B. Placing Planting Soil: Place and mix planting soil in-place over exposed subgrade.
- C. Before planting, obtain Owner's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.2 SOIL PREPARATION

- A. Obstructions Below Ground
 - 1. Remove rock or underground obstructions to depth of 6 inches below bottom of plant ball or root, measured when plant is properly set at the required grade.
 - 2. If underground obstructions cannot be removed, notify Owner for new instructions.
 - 3. Avoid damaging underground utility lines.
 - 4. Repair damage to existing utilities
- B. Final Grades:
 - 1. Minor modification to grade may be required to establish final grade.
 - 2. Ensure proper drainage of site as determined by Landscape Architect.
 - 3. Fine grade areas so finished grades shall be 1 inch in lawn and 2 inches in shrub beds, below adjacent paved areas, sidewalks, valve boxes, headers, clean-outs, drains, and manholes, etc.
 - 4. Surface drainage shall be away from building foundations at 2 percent minimum, for 5-foot minimum.
 - 5. Fill erosion scars and compact prior to planting.
- C. Soil Amendment:
 - 1. Subgrade: 10 inches below finish grade. Layer of soil amendments shall be 8 inches deep, leaving finish grade after watering and settling 2 inches below adjacent paved areas. Excavation and fill may be required to achieve grades.
 - a. Organic Soil Conditioner: 4-inch deep layer.
 - b. Topsoil: 4-inch deep layer.
 - c. Fertilizer: 5 pounds per 1000 square feet of bed area.
 - 2. Spread amendments uniformly, cultivate thoroughly to light and friable consistency, using mechanical rototiller into top 2 inches of subgrade. Make bed approximately 6-inch total depth of amended soil.

3.3 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits.
 - 1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
 - 2. Excavate approximately three times as wide as ball diameter.
 - 3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.

4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
- B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

3.4 TREE, SHRUB, AND VINE PLANTING

- A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
 1. Backfill: Planting soil.
 2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 3. Balled and Potted and Container-Grown Stock: Carefully remove root ball from container without damaging root ball or plant.
 4. Fabric Bag-Grown Stock: Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 5. Bare-Root Stock: Support stem of each plant and spread roots without tangling or turning toward surface. Plumb before backfilling, and maintain plumb while working. Carefully work backfill around roots by hand. Bring roots into close contact with the soil.
 6. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 7. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 - a. Bare-Root Stock: Place tablets beside soil-covered roots; do not place tablets touching the roots.
 - b. Quantity: Two per plant.
 8. Continue backfilling process. Water again after placing and tamping final layer of soil.
- D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.5 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.
- C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- D. Do not apply pruning paint to wounds.

3.6 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.
- B. Use planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.7 EDGING INSTALLATION

- A. Steel Edging: Install steel edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced approximately 30 inches apart, driven below top elevation of edging.

3.8 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use

of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

- D. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- E. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- F. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.9 MAINTENANCE SERVICE

- A. Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:
 - 1. Maintenance Period for Trees and Shrubs: 12 months from date of Final Acceptance.
 - 2. Maintenance Period for Ground Cover and Other Plants: Six months from date of Final Acceptance.

END OF SECTION 329300